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A Summary of Current Program, 9/30/63
and Preliminary Report of Progress
for 10/1/62 to 9/30/63

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MARKETING ECONOMICS DIVISION
of the
ECONOMIC RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

This progress report of U.S.D.A. and cooperative research is primarily a tool for use of scientists and administrators in program coordination, development and evaluation and for use of advisory committees in program review and development of recommendations for future research programs.

The summaries of progress on U.S.D.A. and cooperative research include some tentative results that have not been tested sufficiently to justify general release. Such findings, when adequately confirmed will be released promptly through established channels. Because of this, the report is not intended for publication and should not be referred to in literature citations. Copies are distributed only to members of Department staff, advisory committee members, and others having a special interest in the development of public agricultural research programs.

This report also includes a list of publications reporting results of U.S.D.A. and cooperative research issued between October 1, 1962, and September 30, 1963. Current agricultural research findings are also published in the monthly U.S.D.A. publication Farm Index. This progress report was compiled in the Marketing Economics Division, Economic Research Service, U.S. Department of Agriculture, Washington 25, D.C.

UNITED STATES DEPARTMENT OF AGRICULTURE
Washington, D.C.
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TABLE OF CONTENTS

	<u>Page</u>
Introduction	iii
Area 1. Distribution Programs	1
Area 2. Market Potentials for New Products and Uses	6
Area 3. Merchandising and Promotion	17
Area 4. Economics of Transportation and Storage	27
Area 5. Economics of Product Quality	37
Area 6. Marketing Costs, Margins, and Efficiency	42
Area 7. Market Structure, Practices and Competition	60
Area 8. Information, Outlook, and Rural Development	79
Line Project Check List	88

INTRODUCTION

The marketing of farm products is a major U.S. industry. For food alone civilian expenditures for domestically produced commodities now total \$67 billion annually and are increasing steadily from year to year. The costs of marketing this food aggregate \$46 billion annually, and the share received by farmers amounts to \$21 billion. In addition, the costs of marketing cotton, tobacco, and other nonfood products add significantly to the total marketing bill for agriculture, as do the costs of handling exports.

The central function of the Division research program is to determine the reason for the changes that are taking place in marketing so that ways can be found to increase the efficiency of the marketing system and make it more responsive to changing public needs. This research covers all economic aspects of marketing from the time products leave the farm until they are purchased by ultimate consumers. It includes farmers' bargaining power, the economics of product quality and grade, market potentials for new products and new uses, market structure and practices, marketing costs, margins, and efficiency, economic effects of special programs such as school lunch, special milk, food stamp, and direct distribution, the effectiveness of merchandising and promotion in increasing the demand for farm products, impact of changing transportation legislation and practices on shippers of agricultural products, ways to improve market news and related information, and the possibilities of expanding industrial development in rural areas.

In addition to the major program of applied research, several basic studies are pursued concerning the forces underlying observed market phenomena.

The research of the Division is being carried on by a staff of about 165 professional employees. About 115 of these are in Washington, D.C., and the remainder are located at 27 field stations. Most of the field stations are at land-grant colleges with whom much of the Division's work is conducted cooperatively. Forty-one cooperative agreements or similar understandings between the Division and land-grant colleges or other institutions were operative during the past year.

Part of the research of the Division is conducted by contract with other organizations. Twenty-four contracts were in progress or completed during the past year. Also during the year the Division received trust funds from eight nongovernmental associations, and fund transfers under arrangements with other Federal agencies in eight cases to defray the costs of special research studies undertaken. In addition to these formal arrangements the Division has many other contacts with private marketing firms and associations and with other research groups. It participates, for example, in the planning and review of marketing research being conducted by over 20 regional groups of land-grant colleges.

Highlights of some of the studies completed during the reporting period are as follows:

1. The Market for Food in Schools. -- School lunches provide an outlet for nearly \$1 billion of foods annually. Preliminary findings from a national survey of school food services indicate that more than 85 percent of public school pupils have access to school food services. Nevertheless, nearly 4 million children are attending schools without any food services available or planned by 1964. Costs of localities in providing free or reduced price meals to needy children appears to be a major inhibitor of expanded lunch services. About 86 percent of public elementary and secondary schools were providing milk services compared with 74 percent of the schools 5 years ago.
2. Industrial Possibilities of New Crops Examined. -- Physical science research in other Department agencies and economic evaluations by Economic Research Service are uncovering market possibilities for new crops not now grown on a commercial scale. Some of these may prove to be better alternatives for some farmers who presently are growing grains, cotton, or other surplus products. For example, physical science research has shown that seed of a new potential crop called Indian ironweed contains an oil that is important in the production of plastics. Recent economic investigations indicate that a large potential market (35 million pounds or more per year) exists for such oil at prices which could enable the profitable production of Indian ironweed in certain areas of the country. In fact, research toward early commercial adaptation of this crop is now being urged by potential industrial users. Recent investigations also indicate commercial possibilities for other new annual cash crops, such as vegetable gum crops, to reduce our dependence on imported materials, and annual crops for use as paper pulp raw materials.
3. Food and Beverage Inventories for Civil Defense Planning. -- A study of supplies at the wholesale level of distribution shows that there is a 16.1 days' supply of food and a 4.0 days' supply of beverages in warehouses that operate at the wholesale level of distribution that would be available in the event of a national emergency. A days' supply consists of 2,000 calories for food and 32 ounces for nonconcentrated fluids. Most food in inventory can be kept for a long period of time without refrigeration. Canned and bottled and dried and packaged products represent over 84 percent of total stocks. Of the 16.1 days' food supply, 3.6 days are in grain products, fats and oils, fruits and vegetables; and sugar and sweets each account for over a 2 days' supply. The milk group, meat and meat substitutes, other beverages, and miscellaneous food groups each account for from 0.9 to 1.7 days' supply.
4. Operations of Motor Carriers Hauling Farm Products. -- Progress has been made in measuring the volume and kind of exempt farm products hauled by motor carriers and in determining the business practices, rates, and operating costs of these carriers. Preliminary results indicate that exempt motor carriers' operating costs are probably less than common

carrier costs and that the rates charged generate revenues which average more than enough to meet operating costs. Rates charged shippers for transporting exempt commodities are relatively stable but they do vary in response to supply of and demand for services at particular times and places.

5. Some Cotton Marketing Practices Adversely Affect Use Values of Cotton. -- Analyses of effects of marketing practices and cotton grades on qualities of cotton yarn produced reveal that higher grades of cotton resulting from excessive cleaning at gins frequently produce cotton yarns of lower average quality in appearance and strength than do lower grades of cotton. Certain ginning practices, especially excessive drying and lint cleaning, often necessary to improve the grade of cotton may damage cotton fibers so much that top quality yarns cannot be produced and mill operating costs go up. As a result, present price differentials among raw cotton grades may be too high and may be encouraging undesirable production and marketing practices and damaging the competitive position of cottons in textile product markets. On the other hand, spinning tests indicate that average staple length and length distribution may be more important factors in producing high quality yarns than most mill operators appear to realize. Hence, premiums now paid growers for longer staples may not cover the full value of this fiber attribute to mills.

The value to cotton growers of more than one lint cleaning operation in ginning cotton is seriously in doubt except for the lower grades of cotton. Subjecting cotton grading Middling or better to any lint cleaning usually does not improve the grade enough to offset losses in weight from cleaning and the higher costs of extra cleaning.

6. Processing Plants Located in Rural Areas. -- Substantially increased attention is being given to appraisals of the economic feasibility of various types of off-farm employment opportunities in low-income rural areas. For example, a study concerning the economic basis for constructing a wool scouring plant in a producing area has been completed. It shows that properly blending wool before scouring is an important factor affecting the probability of success of the proposed plant. A study of the possibilities for establishing new livestock slaughtering in the Southeast indicated that in many instances an expansion in slaughter at existing plants would be more economical than establishing new plants. Other studies showed reasonable prospects for success of a vegetable plant in the Southeast and a coconut plant in American Samoa.

7. Price Spreads and Marketing Costs. -- Studies of price spreads and marketing costs for food, cotton, and tobacco were continued and findings were published regularly. Special studies were made of marketing spreads for a number of individual products in 1963.

The total bill for marketing domestic farm-originated food products to civilian consumers in this country in 1963 was estimated at \$45.7 billion. Farmers received \$21.3 billion from these foods, and the cost to consumers was \$67.0 billion.

A new index was constructed showing quarterly changes in prices of intermediate goods and services used by food marketing firms. This index will aid in analyzing trends in the food marketing bill.

Another study shows that convenience foods are having little effect on food marketing costs and retail food prices. For each \$100 spent in grocery stores for food, \$14.03 was spent for convenience items. The cost of duplicating convenience foods with fresh or homemade foods, in the quantities purchased by housewives, would have been \$15.10 or \$1.07 more than the convenience foods, not including any charge for the housewife's time in food preparation. Such a favorable cost differential for convenience foods is due in part to economies resulting from processing foods in volume. Also, savings in handling, transporting, and storage of foods with reduced perishability and bulk, in many instances, more than offset added costs of processing.

A growing effort is being made to inform the nonfarm public of the facts concerning changes in the retail prices of food. The information shows that retail food prices have increased less than consumer prices in general and that the increase in food prices which has occurred has been due to increases in marketing costs and not to increases in the farm prices of food. The Department provided information for leaflets, television and radio presentations that has been used widely by many local groups. The theme "Food Is a Bargain" based on the facts developed by the Department has been employed extensively in newspaper and magazine articles and editorials, in speeches by spokesmen for the food industry, and advertisements and leaflets developed by private firms and trade associations.

AREA 1 DISTRIBUTION PROGRAMS

Problem: For several decades, farming has outrun the manufacturing and distributing industries in achieving greater average production efficiency. Farmers orderly adjustment to this technological revolution has been facilitated by continuing efforts to expand commercial markets and to utilize excess agricultural productive capacity in supplementing diets of children and needy persons. Domestic public food distribution operations including the National School Lunch, Special Milk, Direct Distribution, and Food Stamp Programs provided supplemental foods to more than 22 million persons during 1962-63 and represented an expenditure of more than \$630 million at the Federal level.

There is continuing need for research which will contribute to the attainment of the objectives of distribution programs -- constructive use of surplus agricultural resources and improved nutrition for eligible recipients. Primary research relating to consumption, markets, and distribution and research relating to operational effectiveness assist program administrators in the development of new and the modification of existing programs. Findings relating to attainment of basic objectives and the impact of current or alternative distribution programs upon markets for agricultural commodities, prices, and farm income provide guidelines for broader policy determination.

USDA PROGRAM

The Department conducts a continuing program of research, basic and applied, which is designed to facilitate the full and effective use of distribution programs in creating an expanded market for agricultural products and improving the national health. The primary research effort is concerned with development of new information through special surveys and the application of findings to the operation of distribution programs. Although projects may be undertaken independently, most involve the joint efforts of agricultural economists, human nutritionists, and program specialists.

The distribution programs research staff has its headquarters in Washington, D. C. This staff conducts surveys throughout the United States and supervises work performed by contractors and other Government agencies. One cooperative project is underway with the Minnesota Agricultural Experiment Station.

The Federal scientific effort devoted to research in this area during the past year totaled 5.0 professional man-years. Of this number, 3.7 was devoted to evaluation of food stamp and direct distribution programs; 1.0 to school lunch and special milk programs; 0.3 to away-from-home eating and other related studies.

REPORT OF PROGRESS FOR USDA AND COOPERATIVE PROGRAMS

A. Food Stamp and Direct Distribution Programs

During the past year, emphasis has shifted from evaluation of the effectiveness of the pilot Food Stamp Program in meeting primary objectives of expanding food consumption and improving nutritional levels of participants to consideration of alternative programs for supplementing diets of needy persons and their implications to agriculture. Research findings have provided information basic to administrative and legislative consideration of proposed food stamp legislation. Particular attention has been given to changes in demand for wheat, corn, and other commodities under price stabilization programs occurring with a shift from commodity distribution to food coupons.

(1) Household food consumption surveys were initiated during the past year among low-income households in Choctaw County, Oklahoma, and Escambia County (Pensacola), Florida. The Choctaw County survey was developed to evaluate the effectiveness of the pilot Food Stamp Program in a southern rural redevelopment area. With cancellation of the Oklahoma Food Stamp Program, only the preprogram survey was obtained. This survey, however, indicated the extent to which a Food Stamp Program in such areas must be oriented to needs and requirements of elderly persons and small families.

The Escambia County survey was initiated to provide an evaluation of the effectiveness of commodity distribution in expanding food consumption and improving nutritional levels of recipients. The initial survey was conducted in May-June 1963, and the followup survey in October 1963 after donated commodities have been available for 3 months. Information from Escambia County will be supplemented by food consumption data from Choctaw County, Oklahoma, Detroit, Michigan, and Fayette County, Pa., during periods when donated commodities were available.

(2) Surveys of Retail Food Store Sales. A survey of retail food store sales was conducted in rural Avoyelles Parish, La., before and after initiation of the pilot Food Stamp Program. Under the Food Stamp Program, sales were up approximately 13 percent -- mostly meat and groceries. Produce sales were down 10 percent reflecting availability of home production and other local supplies direct from the producer or roadside stands. Findings will be published late in 1963.

A similar survey was initiated in Choctaw County, Oklahoma. Work was terminated after the preprogram phase with the decision of the State of Oklahoma to continue commodity distribution operations in Choctaw County.

(3) Direct Distribution. Findings from a study of commodity distribution within States were reported previously. With publication of manuscript, research will be terminated.

B. Evaluation of School Lunch Program

Further emphasis has been placed upon research relating to school lunch programs. Particular consideration is being given to availability of school lunch services and means by which services may be made available to more children.

(1) Market for Food in Schools. Preliminary findings from a national survey of school food services indicate that more than 85 percent of public school pupils have access to school food services -- and 75 percent to plate lunches under the National School Lunch Program. Approximately 1 million additional children each year are attending schools with lunch services. Despite this steady progress, nearly 4 million children are attending schools without any food services available or planned by 1964 -- little change over the past 5 years. The local financial burden involved in providing free or reduced price meals to needy children appears to be a major inhibitor to expanded availability of lunch services. Approximately 11 percent of the pupils enrolled in these schools were found to be potentially eligible for gift meals. In contrast, approximately 3 percent of pupils attending school participating in the National School Lunch Program were receiving free meals during March 1962.

During the past year, detailed food information was collected from a subsample of 500 public and 100 private schools offering lunch services. The school food survey will delineate requirements of this specialized outlet for nearly \$1 billion of foods annually and shifts occurring during the past years.

(2) Central Food Preparation and Distribution in Urban School Systems. This research was initiated in response to a request from the Senate Committee on Agriculture and Forestry for a study of nonparticipation of urban schools in the school lunch program because of inadequate facilities with a view of developing methods whereby such schools may be able to become participants.

Five alternative procedures involving use of central food preparation and distribution are being evaluated for feasibility and guidelines developed for use by school administrators in determining applicability within their school systems. Procedures include preparation of regular Type A lunches and sandwich based lunches meeting nutritional requirements in central kitchens and in existing school kitchens, as well as a special tray pack operation. Findings will make use of performance data collected from 8 school systems utilizing these procedures or modifications, thereof.

A final report will be provided by the contractor late in 1963. This report and information from the national survey of school food services will constitute an important segment of the Department's initial effort toward increasing availability of school lunches in economically depressed neighborhoods where they are most needed.

C. Evaluation of Special Milk Program

Information on milk service in public and private schools was obtained as part of the national survey of school food services. Preliminary findings indicate that 86 percent of public elementary and secondary schools were providing milk service. Five years before, 74 percent of the schools were making school milk available.

D. Away-From-Home Eating and Related Studies

(1) During the past year, Departmental and food industry interests in a program of research relating to the institutional market for food have been explored and problem areas delineated. A tentative plan for future research has been developed and submitted for technical review.

(2) Action was initiated, also, under cooperative agreement with the Minnesota Agricultural Experiment Station to develop information concerning consumption patterns of moderately high income families and their relation to economic and social factors which will provide indicators of future changes in demand for agricultural products and marketing services. A conceptual framework and research plan has been developed.

(3) Preliminary action also was initiated in cooperation with the Consumer and Food Economics Research Division, ARS, in planning the proposed decennial food consumption survey and pretesting of the questionnaire in Washington, D. C. The current effort is less than .1 professional man-year annually.

PUBLICATIONS REPORTING RESULTS OF USDA AND COOPERATIVE RESEARCH

Evaluation of Food Stamp and Direct Distribution Programs

DePass, Rudolph E., and Brooks, Thomas M., October 1962. Fruit Consumption Under the Food Stamp Program. (TFS-145).

Reese, Robert B., November 1962. The Pilot Food Stamp Program -- A Continuing Experiment. The Marketing and Transportation Situation. (Reprinted as ERS-97).

DePass, Rudolph E., and Brooks, Thomas M., January 1963. Fish Consumption by Food Stamp and Related Low-Income Families. Reprint: Commercial Fisheries Review. U. S. Department of Interior.

DePass, Rudolph E., January 1963. Influence of the Food Stamp Program on Vegetable Consumption. (TVS-147).

Evaluation of School Lunch Programs

Anderson, Kenneth E., and Reese, Robert B., November 1962. Plentiful Foods Used in School Lunch Programs. Agricultural Marketing

AREA No. 2

MARKET POTENTIALS FOR NEW PRODUCTS AND USES

Problem. Increased emphasis should be placed on new products and new uses because of their importance in expanding markets and maintaining a high rate of economic growth. Agricultural producers and processors need to take maximum advantage of the opportunities offered with respect to additional outlets for surplus supplies, increased returns, lowered costs, and improved competitive positions relative to non-agricultural products. Continuing evaluations are needed of the commercial feasibility and market potentials of new or improved agricultural products, by-products and products from new crops in food, feed, and industrial uses; of the economic feasibility of developing new uses and establishing new crops including appraisal of their impact on present markets; and of the economic and technical requirements of end-uses. Such evaluation will provide a sound economic base for decisions on commercial developments as well as information to guide further utilization research by physical scientists.

U.S.D.A. PROGRAM

The Department has a continuing long-term program involving agricultural economists, economists and personnel with dual economic and technical training engaged in research to bridge the gap between laboratory developments and commercial adoption so as to assist producers to realize more rapidly and more fully benefits of lowered costs, increased returns, and expanded markets that new products and new uses can afford. Research is carried on in industrial and food uses at Washington, D.C. and five field offices -- agricultural economists are located at each of the four Utilization Research and Development Divisions, New Orleans, Louisiana; Albany, California; Philadelphia, Pennsylvania; and Peoria, Illinois; and at the Hawaii Agricultural Experiment Station, Honolulu, Hawaii.

Research is conducted on animal products, cotton, grain and forages, oil-seeds, horticultural crops, new crops and on impacts of technological innovations. Cooperative research is conducted with the Hawaii Agricultural Experiment Station on Kona coffee and Hawaiian fruits and vegetables; with the Pennsylvania Agricultural Experiment Station on maple products; and with the Louisiana Agricultural Experiment Station on a new sweet potato product. Producer groups such as the Louisiana Sweetpotato Commission and the Michigan Apple Commission contribute to studies of potentials of new products pertaining to their area of interest.

The Federal scientific effort devoted to research in this area totals about 20.5 man-years. Of this about one-half represents food uses research and

one-half industrial uses research. Commodity wise 4.2 man-years are currently devoted to animal products; 1.0 to cotton; 3.0 to grains; 2.5 to oilseeds; 3.8 to horticultural crops; and 6.0 to other research principally new crops and impact of technological innovations.

REPORT OF PROGRESS FOR U.S.D.A. AND COOPERATIVE RESEARCH

A. Dairy

In view of declining per person consumption of milk, work is underway to assess the market penetration of low-fat (two-percent milk), its impact on total sales, and its potential for increasing consumption. Preliminary results of a survey of milk dealers indicate this type of product has played a significant role in increases here-to-fore reported for skim milk sales. Low-fat milk is apparently more widely retailed than had been supposed. Detailed analyses are underway to define the position the product has attained in a number of markets throughout the country.

* * *

B. Poultry

Research to determine distribution patterns and acceptance of dried and other egg products in remanufacturing uses was completed with the publication of a report during the year. Results indicate that dried egg products and egg containing prepared dry mixes will increase largely at the expense of frozen eggs. Convenience factors in the use of the dry products appeal strongly to users.

* * *

C. Sheep and Wool

1. Foreign materials in domestic wool create problems in processing and use. A study of the effectiveness of a redesigned shipping container in cooperation with Utilization Research and a private firm in reducing the particularly troublesome jute fiber contamination has been completed. The new type container virtually eliminated jute but other jute-like fibers identified as grass fibers from native grasses and forage were present in much greater numbers than jute. These fibers cause a fabric defect problem similar to jute.

2. A new shrink resistant process ("Wurlanized wool") developed by Western Utilization enables machine launderability and could enhance wool consumption. Research was conducted to evaluate the potential application of this process and its probable effect on demand.

The potential application of machine launderability to 100 percent wool apparel has been evaluated for men's, women's, and children's wear items. Men's and boys' sweaters, knit jackets, and jerseys would have more customer appeal in every price line because of the launderable feature. Wool hosiery would become a much more popular item if the machine launderable characteristics were added. Appeal of light weight, single ply all wool fabric jackets would be improved, particularly for boys. Boys' trousers for school and sportswear would become more saleable by the addition of machine launderability. Sport coats, storm coats and men's trousers would not gain in merchandising value because of additional launderability characteristics. Women's slacks, skirts, blouses, shirts, sweaters, jerseys and cardigans would all be more in demand by consumers if they could be machine laundered at home. The laundering feature should be limited in wool dresses to teenage budget and popular price line merchandise. Launderability in children's wool apparel would be an important selling point in most items. Children's coats of heavy fabric would be an exception. This item is too bulky to launder and still have the dressy appearance wanted.

* * *

D. Leather

Synthetics have been substituted for leather in a number of uses. Market research to appraise the probable extent of this competition and means by which leather may better serve market requirements reveals that leather stands at the crossroads. Shoes, luggage, handbags, and a number of other products, once made chiefly from leather are being made in increasing quantities from non-leather material. Leather is striking back through technological improvements aimed at lowering cost and improving quality. Developments to date have been helpful, such as glutaraldehyde tanning and brine curing but leather's hope lies in the achievement through research of major technological gains.

* * *

E. Cotton

Production of reinforced plastic laminates is growing rapidly. Prospects for greater use of cotton as a reinforcing material in high and low pressure laminates are not encouraging because of competition from glass and other reinforcements. On the other hand flexible laminates, including plastic film forced or backed fabrics, as uses for cotton, are increasing. Improvements are needed to help cotton improve its position in the flexible laminate market. These include availability of cotton cloth free of field trash and excess sizing for good lamination and improved finishes such as moisture resistance after resin treatment.

* * *

F. Oilseeds

1. Qualitative assessment of industrial uses for fats and oils are necessary to determine the economic and technical conditions for market improvement or maintenance in view of competition from synthetic products.

A study of detergents and other surfactants found that about 50 percent of the surfactants produced in the United States are used as detergents. The number of fat-derived surfactant applications is growing, and the volume of these surfactants is likewise increasing. Non-household detergent usage of surfactants has increased faster than household detergent usage; a trend that has been underway for several years.

The resolution of present problems of detergent foam as pollution in fresh water supplies is not expected to have a large effect on marketing fats and oils. The price competition among raw materials for detergents that would lessen this problem is not such as to be strongly attractive to fats and oils.

Most detergent producers did not expect to use synthetics as replacements for natural fatty acids and alcohols in present uses until they were lower in price or offered capabilities not obtainable from fat or oil derived alcohol.

Market assessments are continuing on detergents and other surfactants, polyurethane products, fatty nitrogen compounds, synthetic rubber, surface coatings, and greases, metallic soaps and metal fabrication.

2. Markets for modified edible fats and oils products in four specific food fat and oil areas of application were studied - emulsifiers, confectionery fats, protective coatings, and edible lubricants. Improved emulsifiers probably would not extend fats and oils use but could lead to better end products. Improved confectionery fats could largely displace cocoa butter and improved protective coatings can meet needs not now fulfilled. Modest increases may also come from improved food lubricants. Gains in these latter three areas of application from improved products could approximate 75 million pounds of fats and oils per year within the next 5 years.

3. Some areas of the country are large producers of soybeans and users of soybean meal, but because of lack of processing facilities, locally produced meal is not available. Lower freight costs, due to local soybean processing of unextracted meal could amount to substantial savings and would enable feed manufacturers to produce a high-fat feed without special handling equipment. Economic feasibility of using unextracted soybean meal depends upon the price relationships between tallow and grease and soybean oil.

Case studies of poultry feeds made by 19 feed mills in northwest Arkansas, Delmarva, and north Georgia poultry areas show that at the time of the study, cooked unextracted soybean meal was commercially acceptable and

economically justified. Potential cost savings, exclusive of processing costs for making cooked, unextracted meal ranged from \$2.28 to \$13.51 per ton of soybeans with most feeds, well above the lowest level of \$2.28 per ton. These savings would have been available to cover costs such as milling or flaking, cooking and drying of meal, plus profits to processor.

* * *

G. Grain

1. Adhesives have traditionally been farm derived products but synthetics have taken more and more binding jobs away from them. Study of technical and economic factors indicated that farm derived adhesives have many characteristics that are definite advantages, such as low cost, ready availability, nontoxicity, and ease of handling among others. Nevertheless, farm produced raw materials need to be modified to give them more of the characteristics of the synthetics so they can compete more effectively. The molecular structure of starch and protein glues needs to be modified to make them stronger and more water resistant. Work is also recommended on hot melts based on starch to improve this adhesive's method of application, tack, toughness, solubility in organic solvents, and reduced sensitivity to water.

Such hybrid adhesives would be a boon to the construction industry, among others. Particle board is made by combining sawdust, small wood particles and 30 percent adhesive binder (now mostly synthetics) under pressure. A tough, moisture resistant starch hybrid replacing more expensive synthetics adhesives would considerably lower manufacturing costs.

2. Research is underway to determine the possibilities through freezing for reducing marketing costs for bread which have increased rapidly over the past 15 years. The first step in appraising the feasibility of widespread adoption of freezing has been a survey of about 500 bakers to collect information on bakery operations and the present and probable role of freezing. Nearly 40 percent of the bakers currently are freezing some of their production. The outlook for various uses of freezing for bakery products appears to be one of continuing growth. Many bakers see it as a means of increasing sales by offering a wider variety and fresher quality products at all times at lower cost than without freezing. Other factors favoring increased use of freezing are: (1) The increased use of frozen foods in general, (2) freezing enables "freshness" to be retained longer for the consumer, and thus increases product appeal (even though some bakers say freezing adversely affects other qualities), and (3) the potential cost reduction possibilities offered by freezing.

3. A study of rice distribution patterns for the 1960-61 and 1961-62 crop years has been carried out to provide basic market data to assist the industry in improving distribution efficiency through more detailed knowledge of markets.

In the 1961-62 marketing year, rice millers and repackagers reported the distribution of 15.8 million hundredweight in the domestic continental market for all uses. This is a gain of 3.3 million hundredweight, or about 26 percent over total distribution for the same uses reported in 1956-57. Excluding use in beer, per capita distribution of milled rice amounted to 7.0 pounds in 1961-62 as compared to 5.8 pounds in 1956-57. A number of States registered gains over the previous period indicating consumption is increasing in areas where little rice has been used. Industry-wide promotional efforts coupled with new product introductions appear to be important factors in expanding the domestic rice market.

4. An evaluation is being made, under contract, of the most promising new market possibilities for starch, the primary problem of product development needed in expansion of industrial markets for cereal grains. So far, four types of materials for possible use by three major industries have been suggested as meriting development and testing research. Starch was proposed as a raw material for: (1) A series of high specific gravity compounds potentially more efficient as solvents than present materials in a number of industrial processes, (2) carbonated as a shrink preventative and preservative for concrete, (3) cationic compounds for use in various chemical processing operations, and frozen for changed gel and paste characteristics with potential usage in selected separation of materials in ore and petroleum refining operations.

* * *

H. Horticultural Crops

1. Deciduous Fruit. Research to further evaluate the potentials for super-concentrated apple and grape juices made through Eastern Utilization's essence recovery process is in the data collection phases. Work on dehydro-frozen apples was completed with the publication of a report of findings. A number of processing plants are now in operation and several grocery chains are using this form of apple in their pie-baking operations.

2. Vegetables. Sweetpotato flakes, a new convenient to use product developed by the Southern Utilization Research and Development Division, could help the declining market position of sweetpotatoes.

Initial research - an institutional market test - was completed in January 1963. Research results indicated a highly favorable reaction to the new product by the management, kitchen help and customers of restaurants and other types of institutional outlets. However, for the new product to influence consumption and ultimately, prices and production it must be promoted and distributed on a national scale. The latter is occurring. In the spring of 1962, only one firm processed sweetpotato flakes; today, there are three firms, and in addition, two more commercial plants are planned.

Because of the successful introduction of sweetpotato flakes in the institutional market, pilot research to investigate the potential of the product in retail food store outlets is underway.

* * *

I. Other

1. New Crops. As part of the Department's new crop research program market potential evaluations are needed to provide an economic basis for selection of crops with the greatest market potential for further development and field testing.

This is a continuing line of effort providing economic research needs for the new crops program with research conducted according to program needs. Specific progress can be reported on Crambe abyssinica, a possible new commercial oilseed crop because of its high erucic acid content.

Potential production areas, by Crop Reporting Districts, were delineated in the States of Montana, South Dakota, North Dakota, Kansas, Nebraska, and Texas. In selected Crop Reporting Districts Crambe returns would be higher than the returns from oats, rye, barley, and grain sorghums. Average prices, yields and production requirements were used to compute an estimated cost and returns for Crambe and the alternative crops. The extent of production depends, of course, on markets that can be realized for Crambe products. The market and end-use patterns of rapeseed and rapeseed oil, the present source of erucic acid, were investigated to determine the feasibility of substituting Crambe oil for imported rapeseed oil. Crambe oil may be used as a rubber factice compounding oil in a limited market. It also appears to have limited use in grease and lubricant manufacturing.

2. Hawaii Farm Products. Research continues to determine the economic feasibility of broadening the base of Hawaiian agriculture by developing markets for Hawaiian products such as Kona coffee and fruit juices. Initial work in cooperation with the Hawaiian Agriculture Experiment Station has been devoted to Kona coffee.

A product test is underway in Hawaiian restaurants to ascertain the acceptability and saleability of instant and regular Kona coffee and to provide estimates of potential demand to guide market development efforts.

3. Technological Innovations. Two studies on effects of innovations in food products are underway:

(a). Current phases of work to determine whether convenience foods increase retail food prices has been completed. Of 158 convenience food items 116 were more expensive than home-prepared counterparts while 42 were cheaper. Consumers purchased the cheaper products in such quantities, however, that money spent for convenience foods actually was less than money spent for equivalent quantities of their counterparts. Further analysis of data is

underway to relate relationships of costs and degree of convenience to demand for food items to provide basic information of importance in evaluating prospective acceptance of new products.

(b) New technologies affect the kinds of commodities and the extent to which commodities have markets. Farmers and industry members are interested in the potential impact of new technologies. The freeze-drying process is a new technology just reaching commercial volumes of production. Studies of costs of freeze-dry equipment and discussions with food processing engineers and the examination of pilot plant experience which approaches commercial levels of output, enabled the Department to structure a synthetic series of plant models reflecting different volumes of output, and to ascertain the probable average total unit cost per pound of water removed per product for designated volumes passing through various size plants. The largest size plant has projected freeze-drying costs approximating 4-1/2 cents per pound of water removed, while the smallest size plant has projected costs of 17 cents per pound of water removed, for the same ingredient being processed, and for extensive periods of operation.

* * *

J. Liaison Between ERS and Utilization Research, ARS

An agricultural economist is stationed at each regional Utilization Research and Development Division to provide liaison between the regional laboratories, ARS, and the Economic Research Service in order that economic research may be teamed with physical science research in approaching problems relating to new products and new uses. Phases of work are as follows:

- (1) To delineate the economic problems involved in developing markets for new and extended uses of commodities on which the laboratories are working;
- (2) to develop and assist in carrying out research studies for providing information that would aid the laboratories in deciding what particular products or processes would be most likely to be economically feasible; and
- (3) to develop and assist in carrying out research studies for appraising new products and processes developed by the laboratories, including studies of market potentials, comparative costs, and studies of the probable impact of new developments on sales and farm income.

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AREA 3 MERCHANDISING AND PROMOTION

Problem: Merchandising, promotion, product distribution and movement, and management of marketing firms are basic and essential functions in marketing farm products. The problems of selling efficiency, consumer acceptance, and orderly distribution have grown in intensity for most farm products. Failure to solve or adequately meet these problems has adversely affected producer incomes. In attempting to minimize and overcome these problems, substantial sums are being invested annually by farm groups, especially in merchandising and promotion. Research is needed and is being requested by farm groups to measure levels of advertising and promotional intensity necessary to maximize sales along with the identification of product characteristics which lend themselves to promotional stimuli. There is a continuing need for current information on the availability and extent of distribution of farm products as a basis for orderly marketing and the maximizing of consumer use. Also, there is need to discover basic principles in advertising and promotion which are applicable in general to farm commodities and which can be utilized to strengthen and refine commodity promotional programs. Research in merchandising is needed and basic in the creation of demand and greater consumer acceptance of farm products, particularly for those products subject to impulse buying. A continuing need prevails for information which will assist in improving management efficiency of firms distributing farm products particularly at the wholesale level where firms are often small and in assembly areas where firm ownership and operation is frequently by local farm groups. These firms for the most part do not have the resources or experience to conduct needed research to improve their efficiency and economic well-being.

USDA PROGRAM

The Department has a continuing long-term program of research in merchandising, management analysis, product distribution, and promotion evaluation, designed to provide useful information to producers, handlers, and distributors by which markets for farm products can be maintained and strengthened.

Merchandising research is conducted to quantitatively measure the impact of selected selling practices and pricing policies on sales of and demand for agricultural products. Research in this area is concerned with specific studies such as: Development of income-expenditure elasticities for selected products; identification of consumer and market profiles; and evaluation of alternative package sizes, displays, pricing techniques, and quality of products on consumer purchases. Along with the merchandising research is a relatively small undertaking involving management type studies designed to improve the efficiency of firms distributing farm products with work at the assembly and wholesale level being emphasized.

Research appraising and analyzing promotional programs of agricultural groups is directed toward studies such as: Organizational structure and procedures of commodity groups for optimum control, coordination, and effective conduct of program; measurement of levels of advertising and promotional intensity necessary to maximize sales; and evaluation of effectiveness of alternative appeals, themes, and techniques in selling farm products.

Product distribution research is needed in developing an effective program of demand. This work provides a basis for directing advertising and merchandising activities so as to maximize the impact of these factors on sales of and consumer demand for farm products.

The USDA scientific effort devoted to this research in fiscal 1963 amounted to 17.6 professional man-years. Of this number 1.5 were devoted to dairy products, .7 to poultry, .7 to cross-commodity animal products, .8 to grain and forage, 3.9 to citrus, 2.0 to deciduous fruits and tree nut, and 8.7 to studies involving multiple products of which contracts (multiple products) accounted for 1 professional man-year.

The major research effort is centered in Washington, D. C., with a limited amount of work being done with the following State experiment stations: Arizona, Indiana, Ohio, and Washington. Also, a number of studies are carried out jointly with producer groups who contribute financially to the research program. Included in this category were: The American Dairy Association, Florida Citrus Commission, Oregon-Washington-California Pear Bureau, and the Florists' Telegraph Delivery Association.

REPORT OF PROGRESS FOR USDA AND COOPERATIVE PROGRAMS

A. Dairy

(1) Effect of Different Levels of Promotional Outlay on Sales of Fluid Milk. A study was initiated in March 1963 in cooperation with the American Dairy Association to determine the impact of increased levels of promotional expenditures on sales of fluid milk. The study is designed to determine whether it would be profitable to increase expenditures for promotion of fluid milk above present levels. The levels of expenditures being tested on an annual basis are: 15 cents per capita above present levels and 30 cents per capita above present levels. Present levels of expenditures are being used as a control. The study is being conducted in 6 major market areas and is scheduled to run for a period of 2 years, ending February 1965. In addition to sales data, information is being obtained in each market on level of employment, school enrollments, and selected merchandising practices employed in a sample of retail food stores for fluid milk and ice cream.

B. Poultry

(1) Merchandising Broilers at Retail. In a controlled experiment conducted in cooperation with the National Broiler Council, total broiler sales were 16 percent greater when the quarter cut was added to the retail display than when no quarters were available. Retailers voluntarily assigned more display area to broilers when they added the extra cut, although added sales accompanied the presence of quarters even when adjustment was made for display. Sales were increased most in the market where retailers had featured quarters extensively prior to the study.

During the quarters test, three-fourths of the weekly fluctuations in broiler sales could be associated with price changes, newspaper advertising, display area, and volume of weekly business in the entire store. A broiler feature did not measurably affect meat department gross; while beef and pork specials by the test stores were highly related to increases in department sales. Meat dollar volume in test stores, however, was negatively related to increases in broiler features by other retailers.

C. Cross Commodity

(1) Economics of Pricing, Merchandising, and Labor Utilization in Retailing Meat and Meat Products. This work is being carried out in cooperation with the Ohio State Experiment Station in a sample of retail food stores. A preliminary analysis of data on labor utilization indicated potential savings from more effective planning and coordination of feature promotions, advertising and merchandising, and the use of commodity time requirement data for scheduling and utilizing meat department employees. The impact of features appeared to vary both by type of feature and among stores with the magnitude of the sales variation depending upon the class-of-trade. Preliminary analysis of labor utilization data indicated that at least 90 percent of the variance in man-hours spent processing wholesale cuts into retail cuts is explained by tonnage volume indicating no significant economy of scale. These data along with other data to be collected will be used to develop and test improved managerial techniques that will reduce marketing costs and increase sales of meat products.

D. Grains and Forage

(1) Economics of Inventory Control and Ingredient Procurement in Feed Manufacturing. Reduction in cost and improved pricing efficiency for ingredients used in feed manufacturing through development and application of quantitative techniques of managerial decision making are goals of research being conducted in cooperation with the Purdue Agricultural Experiment Station. Preliminary results indicated opportunities for considerable savings in ingredient costs through use of linear programmed least cost formulas which are being tested prior to introduction of variations of the normative assembly model. Tests are being made of the feasibility of forecasting finished sales and ingredient requirements through experimental smoothing.

E. Citrus

(1) Effect of Special Promotions on Sales of Frozen Concentrated Orange Juice. A special promotion of frozen concentrated orange juice sponsored by processors during 1959 has been evaluated and the findings published. Changes in total promotion investment associated with this campaign are now being measured and will be related to changes in sales volume and returns to producers.

Also, a separate evaluation of a similar promotion conducted in 1962 has been completed. Findings showed that sales of frozen concentrated orange juice exceeded expected sales at existing prices by 2.5 million gallons during the period September through December 1962. Had a price reduction been used to gain this increase in volume, reduction in revenue at retail would have amounted to \$17.4 million as compared with the promotion campaign cost of \$3.5 million.

(2) Consumer Purchases and Availability of Citrus, Citrus Products, and Other Products. This is continuing research in which data are obtained and published monthly showing volume of purchases, proportion of families buying, size and frequency of purchases, and prices paid for citrus and selected competing products. Annually, similar information is provided by geographic regions and family characteristics such as, size of family, presence and age of children, and age and work status of housewife. The data with analyses are supplied to a mailing list of approximately 1,400 producers, processors, marketing, promotion, and research agencies and others concerned with distribution of fruits, juices, and other food products. These data provide a basis for formulating and measuring the effectiveness of specific marketing policies and procedures and in making decisions on allocation of supplies, pricing, merchandising, and promotion. Purchases of citrus have dropped sharply since December 1962, when a freeze severely damaged the Florida citrus crops. Since that time, prices paid for citrus and citrus products have risen but total consumer expenditure for fresh oranges and grapefruit and citrus juices have, in most instances, declined. Consumption of competing products, particularly other juices and drinks, have increased.

(3) Effect of Solids Level on Consumer Acceptance of Fresh Florida Oranges. Work is being initiated in cooperation with the Florida Citrus Commission to determine the effects of varying levels of solids in fresh oranges on consumer acceptance and purchases. This work was originally scheduled for the 1962-63 season but the severe freeze caused a temporary postponement. Indications are that some of the major retail chain buyers of fresh citrus are now specifying or considering buying fresh oranges with higher levels of solids than normally move in the fresh market. The experiment to be conducted in a sample of retail food stores will measure consumer acceptance of oranges of different solids levels with and without price differentials.

(4) Market Development for Desert Citrus. The purpose of this research is to evaluate the potential of the Desert Citrus industry, identify major marketing problems, and appraise the effectiveness of alternative techniques

to promote consumption of fresh citrus. Data have been collected and analyzed as a basis for estimating the potential supply of citrus by type and variety by 1967. Characteristics of local markets are described. Additional work is being developed in cooperation with commodity groups to evaluate alternative merchandising and promotion techniques for grapefruit and oranges. This work is being conducted under a Cooperative Agreement with the Arizona Agricultural Experiment Station.

F. Decidious Fruit

(1) Effect of Color in Consumer Acceptance of Red Delicious Apples. This research provides apple growers with information useful in appraising alternative grading and sorting practices. Through experiments conducted in retail food stores, consumer purchases were recorded for red delicious apples; 75 to 100 percent good red color, 50 to 75 percent, and 50 to 100 percent. No price differential was imposed. Sales from displays having 75 to 100 percent good red color were significantly higher than from either the 50 to 100 percent good red color or 50 to 75 percent displays. Despite a wide range in color, sales from the 50 to 100 percent good red color display were considerably higher than the less fully but more uniformly colored 50 to 75 percent good red color display.

(2) Annotated Bibliography of Apple Marketing Research. Research related to the merchandising and promotion of apples conducted during the past 15 years has been reviewed and some of the most significant findings summarized. Also, research needs in this area are evaluated. This review is being included as a section of a report reviewing results covering a wide range of marketing research.

(3) Merchandising and Promotion Techniques for Winter Pears. An evaluation has been completed of the effect of various promotional techniques on sales of winter pears. Store demonstrations and dealer contests were found to be equally effective in increasing sales. These techniques increased sales by 24 percent and 22 percent respectively, as compared to no promotion. Sales during periods of media advertising at a relatively low level of intensity and during periods of use of special point-of-purchase displays were not significantly different from sales during periods of no promotion. Support given by retailers to each promotional technique appeared to be an important factor influencing sales. The promotional techniques showing the greatest impact on sales were those which the retailer supported most in terms of more favorable consumers prices, greater display space, and featuring of winter pears as part of their newspaper advertising.

(4) Evaluation of the Effect of Various Promotional Themes and Techniques on Sales of Fresh Peaches. A study has been initiated in cooperation with Washington State University to aid peach producers in expanding the market for fresh peaches by providing information necessary for the efficient development and administration of their promotional programs. Specific objectives are to: Evaluate the relative effect on sales and demand for fresh peaches of selected promotional themes and techniques; determine the

relationship of promotional outlay to sales returns for each theme or technique tested; and relate total promotion and advertising to the media advertising done by individual retailers.

G. Flowers

(1) Evaluation of Merchandising and Promotion Practices for Floral Products. Work is being initiated to develop profiles of the floral industry, including availability, movement, and characteristics of markets and consumers of floral products; appraise existing merchandising, promotion, and management practices; and evaluate the effectiveness of alternative merchandising and promotional activities so as to expand and strengthen the demand for floricultural products. This work will be conducted in cooperation with the Florists' Telegraph Delivery Association which is financing a part of the research effort.

H. Horticultural Crops (Cross Commodity)

(1) Increased Producers Sales Through Improved Merchandising. Work has been started to review research conducted by the Department and other sources on retail merchandising and promotion of fresh produce. From this review, research findings applicable to improved retailing of produce will be condensed, assembled, and made available to retailers, commodity groups, and others involved in distribution of produce.

I. Multiple Product

(1) Factors Influencing Use of Point-of-Purchase Materials in Retail Food Stores. Almost 85 percent of the 230 retail food store managers interviewed, indicated usage of point-of-purchase material ranging from moderate to extensive. Price cards, although used more extensively than other types of in-store promotional materials, were not viewed as an effective sales stimulant by a significant proportion of retailers or wholesalers. A majority of respondents both at retail and wholesale preferred p-o-p that feature more than one product. Among the factors having strongest influence on use of p-o-p material were: Support by local or national advertising; attractiveness as a means of improving store appearance; high profit item promoted; and cash or merchandising allowances offered for using material. Close to 60 percent of store managers indicated their usage of p-o-p ranged from 70 to 100 percent of all material made available to them. Of particular interest to the produce industry is the fact that produce was selected more frequently than any other product group or item as being best suited for p-o-p promotion.

(2) Food and Beverage Inventories for Civil Defense Planning. There is a 16.1 days' supply of food and a 4.0 days' supply of beverages in warehouses that operate at the wholesale level of distribution that would be available in the event of a national emergency. A days' supply consists of 2,000 calories for food and 32 ounces for nonconcentrated fluids. Most food in

inventory can be kept for a long period of time without refrigeration. Canned and bottled and dried and packaged products represent over 84 percent of total stocks. Of the 16.1 days' food supply, 3.6 days are in grain products, fats and oils, fruits and vegetables, and sugar and sweets each account for over a 2 days' supply. The milk group, meat and meat substitutes, other beverages, and miscellaneous food groups each account for from 0.9 to 1.7 days' supply. These data compliment those provided in Marketing Research Report No. 577, "Estimated Number of Days' Supply of Food and Beverages in Retail Food Stores, 1962." Another Civil Defense oriented study has been initiated to determine food and beverage inventories in away-from-home eating establishments.

(3) Effect of Store Layout on Purchases of Food at Retail. The traditional food store layout, with dry groceries in the center and perishable foods around the sides, resulted in greater total purchases than the modified store layouts studied. In the modified layout, some perishable food departments are located in the center of the stores' selling area and dry groceries moved to one side. Percentages of customers entering various food departments were about equal in both store layouts. However, customers of the conventional layout stores shopped more of the total selling area and of each department and spent more money per customer than did customers of the modified layout stores.

(4) Economics of Space Allocation and Inventory Control in Retailing Frozen Foods. Cost data have been obtained and procedures developed for allocating various types of costs associated with maintaining inventory, displaying and merchandising frozen foods. These procedures will provide a decision-making tool which can be used by all food retailers in controlling inventory, allocating space, and selecting merchandising practices that will reduce costs associated with retailing and maximize sales of frozen foods. Sales data indicated that controlled changes imposed on the amount of total display space allocated to frozen foods had no significant effect on total sales of frozen food in the test stores.

(5) Inventory Control in Grocery Warehouses. The purpose of this study is to develop techniques for determining optimum inventory levels and economic purchase quantities for items normally carried in grocery warehouses. Retail cost data and a history of sales of each item carried in the warehouse are being obtained from a cooperating grocery wholesaler. Sales data for the six-month period ending June 1963, indicated that 6 percent of the items carried by the wholesaler accounted for 50 percent of dollar sales, and that merchandise purchased from only 3 percent of the firm's suppliers accounted for over 50 percent of the sales dollars.

(6) Impact of Discounting on Food Distribution. Work is underway to obtain information which will permit an evaluation of the impact of pricing policies, procurement, merchandising, and promotion practices of discount operations on conventional food distribution. Information is being obtained from conventional and discount food distributors in 20 Standard Metropolitan Statistical Areas. Field work has started.

(7) Effect of Retail Featuring on Sales and Demand for Farm Products.

Research is being initiated to measure quantitatively the relationships and interrelationships over time between sales and prices of featured items and other non-featured farm products in retail food stores.

(8) Appraisal of the Effectiveness of the Amsterdam Trade Fair Exhibition and Symposium on Sales of American Farm Products. Under formal arrangements between the Foreign Agricultural Service and the Economic Research Service, a study has been initiated to measure quantitatively and qualitatively the influence of the Amsterdam Food Trade Exhibition and Symposium to be held in the fall of 1963 and other supporting publicity on (1) the demand for American products in Western European countries, and (2) the image of United States agriculture and importance to the Atlantic Community of more liberal trading policies.

(9) Survey of Expenditures by Commodity Promotional Groups. A study has been initiated to up-date an earlier survey conducted in 1958 to determine the extent of promotion by producer-oriented promotional organizations. The earlier survey found that there were approximately 1,200 promotion groups whose combined annual expenditures for promotion were close to \$70 million. Work now underway will provide information as to total level of expenditures by producer promotion groups, magnitude of expenditures by type of product, relative importance of different methods of obtaining funds, the extent of brand promotion and expenditures for promotion in foreign countries. This survey is being conducted by mail with an 80 percent response having been obtained to date.

(10) Advertising Procedures and Practices of Agricultural Commodity Groups. A study of producer groups and firms promoting agricultural products found a wide range in expenditures for this purpose and in the nature of their promotional activities. Very limited research was being conducted to provide guidance in formulating, directing, and evaluating promotional activities. Many producer groups tended to spread relatively limited budgets over a wide range of promotion activities. Advertising agencies, when employed, often played a dominant role in a producer groups' promotion program. Promotion groups generally tended to express their promotional goals in broad terms such as to increase sales rather than specific goals or targets. It appears that many groups could improve the efficiency of their promotion program by subjecting them to sound management procedures and control.

(11) Advertising Expenditures of Food Marketing Corporations. Data from the Internal Revenue Source Book, including advertising expenditures, total costs, total sales, and total net income have been obtained for each of the food and kindred products manufacturing and marketing industries. These data are being analyzed to determine the relationship of advertising expenditures to size of firm and type of business as well as to other firm expenditures.

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AREA 4

ECONOMICS OF TRANSPORTATION AND STORAGE

Problem. Transportation economics research --as related to farm products and farm production supplies-- is concerned with learning where farm products and supplies move, how they move, why they move the way they do, and how they could be moved better for less money.

Obtaining information for research pertaining to these subjects is easy in some areas and difficult in others. For rail transportation it is easy. For highway and for waterway transportation it is difficult. Rail freight rates and rail traffic statistics are available because these facts are submitted by the carriers to public regulatory agencies and those agencies make that information available to all.

Truck transportation of unprocessed farm products is provided mostly by truck owners who are exempt from public regulation insofar as freight rates, charges, and routes traveled are concerned and who do not file financial and statistical data with public regulatory agencies. For that reason, good truck statistics are not available.

Farm products in bulk form --unpackaged, unmarked, and uncounted-- as well as certain farm supplies and other nonfarm products are permitted by law to move by inland waterway under much the same unregulated conditions as unprocessed farm products move by truck.

The motortruck and barge exemptions maximize geographical flexibility and contribute to economical transportation operations, but these exemptions also create important data gaps.

Because of these gaps transportation research involves the collection of basic data as well as the analysis of these data. The Department is working --or plans to work-- in the following important areas:

1. Origin and destination statistics (i.e., tons, ton-miles, etc.) for exempt highway and waterway transportation, separated by classes of commodity.
2. Freight revenues collected by highway and waterway carriers, separated by geographical areas and by classes of commodity.
3. Highway and waterway carriers' operating costs, separated by area of operations and by classes of commodity.
4. Indexes of motortruck and barge freight rates for farm products and farm production supplies.
5. Origin and destination statistics for air freight movement of farm products and charges made by the carriers for hauling such products.

Transportation economics research includes also studies to measure the revenue requirements of rail, highway, airway, and waterway carriers. Carriers' charges must yield revenues sufficient to cover the carriers' costs of new equipment and facilities and provide them with capital to build organizations that can give the quantity and quality of service needed by shippers. The charges carriers make and the expenses carriers bear directly affect Agriculture.

Since the Nation's transportation laws affect freight charges paid by shippers of farm products and farm production supplies, economic research continually strives to appraise the impact of current transportation laws and evaluate the probable effect of proposed changes in them. Proposals for major changes in the Nation's transportation laws are before Congress now. These directly involve Agriculture and for that reason more attention is being paid to policymaking problems than ever before.

USDA PROGRAM

Research projects and intradepartmental reports on transportation are prepared by ten professionals. This work is carried on primarily in Washington, D. C., but one project is underway at Bozeman, Montana, and one is under contract at Manhattan, Kansas.

Grain transportation research underway covers four broad geographical areas of the Nation: the Northwest, the Southeast, the North Central, and the South.

Findings show conclusively that the physical movement patterns are changing rapidly and that these changes are not uniform in all areas. An important factor is that some railroads have lowered freight rates to reflect their use of better equipment. Also, they have established lower freight charges for movements in which they provide only bare-bones through-transportation services. The availability of lower rates discourages the use by shippers of stops in-transit, out-of-line routing, and excessive detention of cars for loading and unloading. Other important factors influencing the changes are unequal rates of construction of new highways and extension of navigable waterways.

These transportation trends are lowering some shippers' costs and at the same time are causing many grain merchandisers to modify their storage practices. Rail charges for moving grain in large volume lots to ports for export have been lowered to levels that trucks usually cannot equal; only barges, where barge service can be provided, can compete.

Motortrucks are moving grain longer and longer distances and in larger and larger amounts, particularly in some sections of the country. Truckers seek grain traffic when loads of grain can constitute either the beginning or ending half of roundtrip hauls involving another payload the other way. Such motortrucking operations, for instance, are growing rapidly for

midwestern grain moving to Southeastern States where poultry and other livestock production is growing. Truckers hauling grain south haul fruits and vegetables north. The same trucking development is evident in grain moving from surplus areas of the Northwest to the West Coast. These trucks are used to haul "exempt" fruits and vegetables eastbound; in addition, they often haul nonfarm traffic under lease for certificated carriers.

Barge operators are attracting grain traffic away from the railroads by offering low rates for hauls from waterway origin points to waterway destination points as well as by offering low through rates from inland origin points to inland grain consumption points. This truck-barge-truck service involves a combination of highway and waterway service and is giving the railroads a type of competition they have not experienced previously. They are attempting to meet this competition by expanding barge-rail joint service. Origin points 50 miles or more from the waterway and destination points located substantial distances from the nearest waterway unloading point are now being served in this fashion.

The grain projects for the four areas listed above, together with one planned for California and another for the Northeastern States, will blanket the Nation with studies of this type. When all of them have been completed they will be consolidated and summarized to make a report on Nationwide grain transportation.

Notable changes in the activities of commercial hay dealers have resulted from the growing practice of dairymen to buy hay to meet their specific needs rather than to raise and feed whatever quality they have, depending on the growing season.

At the request of hay dealers, research is underway to help them become better informed about hay production surpluses over wide areas of the Nation and to find ways to move it from more distant surplus production areas to deficit areas. These transportation problems have been aggravated in recent years by severe droughts in some States and territories. The research project will locate areas normally producing surpluses and will seek ways for preparing hay and loading it in a manner that will cut transportation costs and lower the delivered prices to consumers. Better preparation of hay for transportation --such as higher density baling enabling heavier loading of transportation equipment-- will enable the carriers to provide service at lower charges per ton or per car.

Cotton transportation from gins to warehouses and then on to mills is changing. Whereas railroads once carried almost all this traffic, trucks now haul a substantial share of it, particularly from gins to warehouses. Preliminary statistics indicate that truck transportation now accounts for 25 percent or more of all transportation service involving cotton. A project is underway to measure the total flow of cotton, by type of carriers, and to learn the transportation costs involved in moving it. These data

will provide new insights into marketing costs and perhaps indicate ways that cotton transportation costs can be reduced.

Fruit and vegetable transportation from California and Arizona is undergoing significant changes, some of which have already been identified in a research project involving the collection of data from California and Arizona shippers and from receivers located at major United States markets.

Motortrucks are constantly increasing their share of this traffic moving to points west of the Mississippi River, and they collect payments for their services that exceed amounts railroads would have charged for moving the same volume of traffic. The shippers pay truckers premium rates because, as studies show, motortruck service is more flexible both in terms of physical movement and in terms of load consist. And it is often faster and more reliable than rails for hauls as far east as the Mississippi River.

Railroads, however, continue to handle almost all California and Arizona produce to points east of the Mississippi River. Truckers have not been able to penetrate to any notable degree the eastern half of the Nation. Distances involved are too great and return payloads are not generally available.

A study of the movement of Florida citrus fruits and vegetables is being discussed with producers and handlers in that State. This project would collect quantitative data about the relative importance of rail and truck transportation and about freight charges. Such a study would provide valuable insight into the actual and potential use of rail piggyback service.

Each year the Department makes an estimate of the total transportation bill paid for moving farm products for civilian consumption. This estimate is based on published rail freight traffic data as well as on imprecise unpublished highway traffic data. For 1962 the transportation bill was \$4.26 billion. This is the same amount as a year earlier.

An inventory of trucks capable of hauling farm products is urgently needed. Sound economic research in highway transportation of farm products and production supplies is virtually impossible until researchers have information about the volume of exempt farm traffic hauled by motortruckers and their charges.

Exploratory work is being conducted on an inventory that will provide a basis for further research along these lines. (The Bureau of the Census is making a Census of Transportation that includes a truck inventory, but this is a sampling of trucks rather than a listing, and for that reason will not provide the data Agriculture needs.)

Agriculture generally seeks to preserve the limited degree of regulation of highway and waterway carriers where products of direct interest to Agriculture are concerned.

Congress now has before it bills which offer two alternatives for modifying existing laws regarding the conditions under which farm products and supplies are hauled. One alternative is to intensify competition among the carriers by permitting the railroads to haul, at rates suitable to them, unprocessed farm products as well as commodities that can move in bulk. These rates would not be subject to veto or modification by public regulatory agencies. This change would give the railroads much the same opportunity to compete for this traffic that highway and waterway carriers possess now. The other alternative is to bring under public regulation all for-hire motortruckers and barge operators.

If the interests of Agriculture are to be presented effectively, research needs to provide measures of the financial and service benefits to Agriculture of the freedoms with which highway and waterway carriers operate. During 1963 two projects were completed. One identifies the types of agricultural products most often hauled over the highway. The other was a pilot project that indicated the level of revenues acceptable to highway carriers and expenses borne by these carriers.

Much more research is needed in these areas. Definitive data are needed about the aggregate volume of traffic hauled by exempt carriers, the freight charges they make, and their costs of providing the service.

The Department needs operating cost information for each carrier type to enable it to compare the cost of one type with others and to suggest to shippers less costly means of transporting farm products and supplies. Without this information it is impossible to determine accurately the most efficient marketing channels --both in terms of money paid by shippers for transportation and in terms of service itself.

Research techniques for measuring motor carrier costs have been developed through one pilot project and a more comprehensive study is being prepared.

Improvements in transportation equipment affords the agricultural transportation user potential savings in shipping and handling costs. Preliminary results of a study concerning the economic feasibility of using covered hopper cars for rail movements of grain show that these cars offer potential savings to the grain shippers. Such research can be used to make the shipping public aware of improvements providing potential savings. Many shippers may otherwise miss these advantages, either because of inherent resistance to change or because of a lack of knowledge.

REPORT OF PROGRESS FOR USDA AND COOPERATIVE PROGRAMS

A. Grain and Forage Crops

1. Grain Transportation in the Northwest. In the Northwestern States of Montana, Idaho, Utah, Wyoming, Oregon, and Washington, railroads haul most of the grain shipped from country points to processors and to millers,

primarily because of the in-transit shipping privileges provided by the railroads. Country operators located at or near river transfer facilities are turning to trucks and barges, or a combination of those carriers. Railroads generally cannot compete effectively with the low cost transportation offered by the truck-barge combination for movements of grain bound to Pacific ports for export.

During the crop year 1960-61 about 40 percent of the trucked grain was hauled by common or contract carriers. Exempt motor carriers moved 32 percent and privately owned or leased trucks carried 26 percent. Itinerant buy-and-sell merchant truckers handled only 2 percent of the grain trucked from country points.

The results of a detailed analysis of the movement of "free" wheat in the State of Washington have been published in speech form.

The Portland port area, including Longview and Vancouver, received the bulk of the rail shipments from country origins in Washington. In 1960-61 the Portland area received 39 percent of the total rail movement of wheat. Twenty-two percent of the rail wheat moved to Puget Sound ports, 24 percent went to the Pasco-Kennewick area, and 11 percent went to Spokane. The remainder was shipped to smaller or unknown markets in the Northwest or to California. Most of the wheat shipped by rail to Pasco-Kennewick is probably reconsigned to be terminated at Columbia River or Puget Sound ports. Probably a portion of the wheat shipped to Spokane continued to the coastal ports. All the rail movement could be considered longhaul movement since the rail cars generally originated at the producing area and terminated at the major coastal markets.

Trucks hauled about 13.9 million bushels or 28 percent of total "free" wheat shipments in Washington during 1960-61. Fifty-two percent of the truck shipments to known destinations moved less than 150 miles, 39 percent was shipped 150-299 miles, and only 9 percent traveled 300 miles or more.

Washington country elevator operators estimated that about 27 percent of their truck shipments of wheat in 1960-61 moved directly from farm storage to terminals or other receivers. This selling method probably saves the farmer money and time since he does not have to deliver the grain to the elevator.

All data for the Northwestern Survey have been gathered and analyzed. The manuscript is nearing completion and should be ready for review during the fourth quarter of calendar year 1963.

2. Grain Transportation in the Southwest. The study of grain transportation in the Southwestern States of Arizona, Colorado, New Mexico, Oklahoma, and Texas will be completed by the end of the calendar year 1963. This study is being done, under contract by Agri Research, Inc., subsidiary of Dunlap and Associates, Stamford, Connecticut. The findings are based on data collected by means of personal interviews with 470 country elevators,

terminal elevators, feed manufacturers, and flour mills. The 470 firms interviewed represented about a 20 percent sample of grain handlers in the States covered by the survey.

3. Grain Transportation in the North Central and Southern States. The studies of grain transportation in the North Central and Southern States are cooperative projects with regional grain marketing committees.

Data have been collected in both areas and are being analyzed. Significant changes in grain marketing practices are being found. The relative importance of the various carrier types is changing with truck and barge transportation becoming more important and railroads less so in southbound movements. The changes in the use of the various modes of transportation are causing changes in the location and the use of storage facilities. Storage facilities are tending to be located and expanded either near production areas or processing points.

B. Fruits and Vegetables

1. Fruit and Vegetable Transportation. The volume of fresh produce shipped interstate from California-Arizona production areas has remained relatively constant since 1951. Total traffic handled by both railroads and trucks has averaged about 350 thousand carlot equivalents annually. Approximately 60 percent of the interstate shipments from California-Arizona origins moves to destinations east of the Mississippi River. About 32 percent moves to points west of the River, while 8 percent is dispatched to Canada and Mexico. In 1951 rail carriers handled 87 percent of the shipments to United States outlets and 93 percent of the traffic routed to Mexican and Canadian destinations. Since then, rails' share of the annual volume shipped from California and Arizona to interstate markets has dropped to 70 percent and to 81 percent of the movement into Canada and Mexico during 1960. This loss by the railroads to trucks occurred primarily in that traffic moving to points west of the Mississippi River.

The ability of motortrucks to perform multiple pickup and multiple dropoff service, to make faster deliveries, and to offer greater flexibility for servicing less than truckload consignments were prime factors contributing to their success. Trucks are providing services that rails cannot duplicate economically.

The shipper survey phase of the two-part study is in manuscript form. The receiver phase will follow. Publication of the first phase is expected during the fourth quarter of calendar year 1963. Data are complete for the second phase.

C. Nature and Scope of Operations of Motortruckers Engaged Primarily in For-Hire Hauling of Exempt Farm Products

1. Mail Survey of Truckers of Farm Products. Data assembled from a 27 percent return of questionnaires mailed to a list of truckers of farm

products showed that these 1,514 truckers moved more than 9 million tons of exempt commodities in 1960. They traveled 278 million miles in these operations, some of which were Nationwide. A report was published on this part of the project. (Marketing Research Report No. 585.)

2. Personal Interview Survey of Truckers of Farm Products. Another phase of this survey involved personal interviews with 300 for-hire truckers. Our findings indicate that: (a) the main source of competition of motor-truckers primarily engaged in for-hire hauling of unprocessed farm products was from other exempt for-hire truckers, (b) most carriers reported that they make the rates paid for their hauling services, (c) the predominant method of arranging for carriage was for shippers to call the carrier, and (d) most truck owners did not trip lease their equipment to others, but those who did derived a quarter or more of their income from trip leasing. The manuscript for this part of the project is in the final editing stages. Publication is expected during the last quarter of calendar year 1963.

3. Mail Survey of Truck Owners Not Engaged Primarily in For-Hire Transportation. Motortruck owners who do not engage in for-hire transportation as their primary business do haul substantial quantities of exempt farm products. A mail survey of these truckers has been completed. Five thousand five hundred truck owners responded to the Department's questionnaire. The data are being summarized and analyzed. The findings will be published in 1964.

D. Revised Rail Freight Rate Indexes

1. Rail Freight Rate Indexes. The base period for rail freight rate indexes has been shifted to 1957-1959=100 from 1947-1949=100. A report describing the new procedures will be published late in 1963 or early in 1964.

The new indexes will include the following commodity groups: grains (feed and food); fruits and vegetables; cotton; soybeans; leaf tobacco; livestock; meats (fresh, cured, and packinghouse products); wool.

E. Operating Costs of Motortruckers of Exempt Farm Products

1. Motortruckers' Operating Costs. A pilot study of operating costs of 25 truckers engaged in for-hire trucking of exempt agricultural products was completed in February 1963. (Economic Research Service 109.)

This study indicated that: (a) for-hire motortruckers of farm products are usually small, (b) average gross revenue per vehicle mile in 1960 was 30½ cents, (c) average total trucker cost per vehicle mile in 1960 was 29 cents, and (d) average total mileage per trucking firm in 1960 was 361,000.

This pilot project has demonstrated that a more comprehensive survey is feasible. Such a survey is being prepared.

F. Transportation Technology

1. Covered Hopper Cars for Moving Grain by Rail. A study of the feasibility of using covered hopper cars for moving grain is nearing completion. All research data have been assembled and analyzed; a first draft of the manuscript has been reviewed.

It appears that the utilization of covered hopper cars would be very comparable to the present utilization rate of boxcars when in grain service, even with a 100 percent empty car return. The greater capacity of the new lightweight covered hoppers enables carriers to operate them with a per unit cost generally lower than the standard boxcars at comparable utilization rates.

About 40 percent of the country elevators surveyed are equipped to load covered hoppers and over 60 percent of the terminals and processors can load and unload them. Firms presently unable to use covered hoppers indicated their willingness to arrange to do so, within the range of their individual economic capabilities. Judged on the basis of costs of necessary changes in loading and unloading equipment, covered hopper cars seem to be more acceptable than semitrailer trucks as a substitute for standard boxcars in the movement of grain.

G. St. Lawrence Seaway Transportation

1. Seaway Traffic Trends. Tonnage of traffic moved on the St. Lawrence Seaway has more than doubled since 1958. Of the 26 million tons of cargo in 1962 nearly one-half represented agricultural tonnage. Although growth in Seaway traffic since it first opened to larger ocean-going vessels in 1959 has been spectacular, the rise in tonnage was less than expected. At the current rate of growth it is not likely that a hoped for Seaway tonnage of 50 million can be attained by 1968. Future Seaway traffic is likely to be dominated by agricultural commodities and iron ore.

During the last year a report was completed and published on the Changing Shipping Patterns on the St. Lawrence Seaway, Marketing Research Report 621.

REPORTING RESULTS OF USDA AND COOPERATIVE RESEARCH

USDA Research

Farm Products Hauled Over the Nation's Highways

DeWolfe, Mildred R. 1963. For-Hire Motor Carriers Hauling Exempt Agricultural Commodities -- Nature and Extent of Operations. Marketing Research Report No. 585. U. S. Department of Agriculture, Economic Research Service, Marketing Economics Division.

Operating Revenues and Costs of Highway Carriers Hauling Farm Products

Hunter Jr., John H. 1963. Costs of Operating Exempt For-Hire Motor Carriers of Agricultural Commodities -- A Pilot Study in Delaware, Maryland, and Virginia. Economic Research Service 109. U. S. Department of Agriculture, Economic Research Service, Marketing Economics Division.

St. Lawrence Seaway Transportation

Thuroczy, Nicholas M. August 1963. Changing Shipping Patterns on the St. Lawrence Seaway. Marketing Research Report No. 621 (ERS Staff Report). U. S. Department of Agriculture, Economic Research Service, Marketing Economics Division.

Air Freight of Farm Products

Hunter Jr., John H. 1962. Recent Trends in Air Movement of Agricultural Perishables. Marketing and Transportation Situation, November. U. S. Department of Agriculture.

Cooperative Research

Grain and Forage

Brooks, Robert G. 1963. Potential Effects of the Proposed Tennessee Tombigbee Waterway on Mississippi Grain Marketing. Bulletin 663. Mississippi State College. State College, Mississippi.

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AREA 5

ECONOMICS OF PRODUCT QUALITY

Problem. Adequate quality standards are essential for the effective functioning of prices in the allocation of resources and in the selection of production and marketing practices. The Department is responsible for, and historically has been active in, the development and maintenance of adequate quality standards for a wide range of agricultural commodities. The development of these standards has facilitated the development of dependable market information and acted to strengthen the competitive position of growers generally. Changes in demands of consumers and technological developments in production and marketing have created the need for new and improved quality standards.

USDA PROGRAM

The Department's program of basic and applied research on the economics of product quality includes study of the problems of seven different commodity groups. Work on all commodities is carried on in Washington. Work on protein content of milk is being done at Davis, California, under contract with the California Agricultural Experiment Station. Studies of cattle shrinkage are conducted cooperatively with the Colorado Agricultural Experiment Station. Research relating to evaluation of cotton quality is done at Clemson, South Carolina, in cooperation with Clemson College, ARS, AMS, and the Foundation for Cotton Research and Education; and at Durham, North Carolina, under contract with Research Triangle Institute. Work on quality changes in cotton during storage is conducted at Tucson, Arizona, and Stoneville, Mississippi.

The Division devoted 14.3 professional man-years to the study of economics of product quality in 1962-63, distributed as follows: Dairy products 2.0; poultry and eggs 1.5; sheep and wool 0.9; swine 0.9; cotton and cottonseed 7.3; tobacco 0.5; grain and forage 0.2; and fruits and vegetables 1.0.

REPORT OF PROGRESS FOR USDA AND COOPERATIVE PROGRAMS

A. Dairy

1. Variability of Butterfat Tests. Measurements have been completed and analyses have been made of the day-to-day variability of individual producers' butterfat percentages, the day-to-day variability in the average test of all milk delivered to a plant, and the relationships of "biases" between butterfat percentages from composite samples and those from daily fresh samples during the compositing period, over a wider range of conditions and for longer periods than had been covered in previous studies.

The results present the most complete picture available of the range of variation and the proportion of differences of specified amounts that may be expected to occur when methods of sampling and testing are followed by proficient, unbiased technicians, for several types of comparisons; for example, comparisons between plant averages of 7-, 10-, or 15-day composite tests during the month and averages of fresh tests on from 1 to 4 days during the month, or comparisons between plant averages of fresh tests on 4 days a month and averages of fresh tests on from 1 to 12 days per month.

Multiple regression equations have been developed for estimating the day-to-day variability in the average of fresh tests of all milk delivered to a plant, based on the average within-producer variability and the number of producers, to be used with a seasonal factor for each month. These calculated variances will be the most useful in estimating plant averages for selected days during a month in comparison with the true average for all days during the month if they are based on within-producer estimates calculated (or estimated from two or more daily samples for each producer during the month) for the plant in question instead of being based on the averages shown for all plants. A purely statistical standard cannot be relied on as the sole means of evaluating differences between butterfat percentages from composite tests and from fresh tests. Compositing procedures are very important.

2. Methods of Determining Protein and Solids-Not-Fat as a Basis for Purchasing Milk. Technical work under the AMS portion of the study has been virtually completed. Economic analysis will get underway during the coming year.

B. Poultry

1. Egg Quality, Costs and Returns. The effects of three factors--full-time or part-time producer, size of flock, and size of egg--on egg quality at 10 plants over a year's time are being analyzed. Later phases will deal with the causes of variation in quality and its effects on marketing costs and returns to producers.

C. Sheep and Wool

1. Effects of Lamb Grades. The Federal Standards for lamb effective in 1960 were more successful in describing lamb quality than were the previous standards. The trade appears to be more satisfied with the new Federal lamb grades. The new grades are more widely used than were the old grades. Producers appear to be responding to the change by producing lambs better suited to current consumer preferences.

Price analysis suggests that factors other than Federal grades were responsible for the 1958-61 lamb price decline.

On balance, U. S. grades have a positive effect on lamb marketing. They promote competition and may tend to lower marketing costs. They tend to prevent packers and retailers from widening margins at the expense of their suppliers and consumers. Although Federal grades do not affect all segments

of the lamb industry equally, the net impact appears to be favorable from the public interest and overall industry point of view.

D. Swine

1. Grades for Hogs. Current standards for barrow and gilt carcasses are quite good. Some of the modifications that are often suggested would not improve the standards which rely on backfat thickness and weight or length. These factors are good indicators of percent lean cuts, and percent lean cuts, given weight or length, is very closely associated with value. Paying price differences can be evaluated on the basis of value differences between grades computed under different price and grade distribution.
2. Grade Composition of Market Hogs. Of barrow and gilt carcasses, 33 percent graded No. 1; 39 percent graded No. 2; 26 percent graded No. 3; 2 percent graded medium, and less than 1/2 percent graded cull.

Other results of the study include distribution of barrow and gilt carcass length and backfat thickness by grade and distribution for sows.

E. Cotton and Cottonseed

1. Economic Evaluation of Cotton Quality. A completed test of the effects of multiple lint cleaning in three major cotton-producing areas indicates that the use of these devices tends to lower returns to farmers for the better grades of cotton but results in moderate to substantial increases in return for lower grades, particularly for cotton that would have been classed as grassy, Light Spotted, or Spotted without such treatment. The use of this ginning equipment appears to have some unfavorable influence upon the competitive position of cotton as a result of increased manufacturing cost and somewhat lower quality of products manufactured from cotton cleaned with this equipment. Preliminary results of a spinning test involving cotton subjected to variations in defoliation and cleaning practices indicate that fiber and spinning properties may be significantly damaged by preharvesting practices which result in immature fibers, and that this damage is further intensified by extreme cleaning practices. Some damage to fibers can be offset in processing by variations in twist, speed, or yarn count but only with some increase in cost of processing.
2. Quality Changes in Cotton During Storage. Samples taken at the time cotton was placed in storage but kept under identical conditions as the bale provide an adequate basis for determining quality of cotton stored for up to a year. Beyond that time, new samples probably will have to be obtained in order to assure representativeness of quality of the bale. However, since most cotton moves within a year, a substantial reduction in cost for resampling can be obtained by taking additional samples at the time bales are placed in storage and keeping them with the bales for later use.

A report in process of review which compares the quality and market value of bales based upon automatic and cut samples indicates that generally no significant differences exist between such samples when evaluated shortly after ginning. However, when stored for 2 years, some significant, but not always consistent, differences were found in both grade and staple length based on the two types of samples.

F. Tobacco

1. Tobacco Quality and Prices. An accurate determination of tobacco quality components and their relationship to economic value is basic to efficient marketing of tobacco and to accurate prices of tobacco to growers. The purpose of this project is to determine the interrelations among tobacco prices to growers, market conditions, and tobacco quality factors, and to suggest improvements in present grading and pricing procedures. This project is particularly appropriate now when these relationships obviously are changing rapidly as a result of changes in production methods and other factors.

G. Grain and Forage Crops

1. Evaluation of Hay Grading. A completed mail survey shows that (1) Federal hay grades need revision to include chemical tests and moisture determination; (2) chemical and moisture changes of alfalfa during storage are very small, indicating that the change in economic value is also small; and (3) no significant change was found in the number of cores of alfalfa needed to provide a representative sample to be used for chemical analysis.

H. Fruits and Vegetables

1. Feasibility of Radiation Pasteurization. The Atomic Energy Commission is interested in determining if radiation pasteurization of fresh strawberries, peaches, citrus fruits, grapes, and tomatoes is economically feasible. Preliminary results of this study indicate that under present marketing practices product losses in marketing channels are as high as 15 percent. Interviews with representative samples of packers, shippers, and retailers of these fruits indicate a definite desire for extension of shelf life of these products, possible through radiation pasteurization, and a willingness to accept such products. The marketing firms interviewed indicated that the major disadvantage of the process probably would be consumer resistance, but that this might be overcome through an educational program. Work is now in progress on the developments of estimates of the cost of radiation pasteurization to assist the AEC in developing designs for suitable equipment and facilities. This research is a part of the AEC program for expansion of the peaceful uses of the atomic energy.

PUBLICATIONS REPORTING RESULTS OF USDA AND COOPERATIVE RESEARCH

Sheep and Wool

Fienup, Darrell F., Motes, William C., Hienstra, Stephen J., and Laubis, Robert E. February 1963. Economic effects of U. S. grades for lambs. AER-25.

Cotton and Cottonseed

Ross, John E. 1963. The impact of harvesting and ginning practices on buying habits of mills. Article in Cotton Trade Journal, Production-Mechanization Supplement. January 7.

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AREA 6

MARKETING COSTS, MARGINS, AND EFFICIENCY

Problem. Agriculturally-linked industries in the United States have made great progress in recent decades in increasing efficiency and reducing costs. The American system of marketing farm products is highly efficient and it is admired throughout the world. Public-sponsored research, particularly research on marketing costs, margins, and efficiency, has contributed greatly to this progress. Nevertheless, serious problems of inefficiency in marketing remain to be solved. In most industries, rates of development and adoption of new economic and technological innovations remain high, and producers and marketing firms continue to face substantial adjustments to remain competitive. As a result, managers of marketing firms need accurate information on costs, operating margins, cost standards, and factors affecting efficiency as aids in making sound decisions that affect not only their own operations, but also returns to farmers, prices to consumers, and the public welfare. Research in this area also has important benefits to officials in public agencies responsible for public programs affecting agriculture and to teachers and extension workers. In our present highly dynamic economy, trial and error methods of determining costs and improving efficiency generally are too crude to be tolerated. Furthermore, only a few agricultural marketing firms are large enough to afford the costs of a competent professional research staff. Therefore, the need for research in this important problem area must continue to be primarily by public agencies.

USDA PROGRAM

The Department has a continuing long-term program of research in marketing margins, costs, and efficiency designed primarily to provide useful information on the amounts and trends in marketing margins, costs of marketing, labor and equipment requirements, cost standards, economies of scale, and other factors including marketing practices, affecting costs of marketing through all important trade channels and types of firms and for all farm products marketed in commercial volumes. Most of the research is problem-solving in nature, and is conducted by professional agricultural economists. Some studies are conducted in close cooperation with agricultural engineers and members of other disciplines. In nearly all studies close cooperation is maintained with industry and trade groups and with private firms that generously provide essential data and make plant facilities available for observation and the conduct of various market tests. Although most of the research is conducted by personnel in Washington, D. C., a considerable part of the work is done by USDA professional staff located at field stations in several States. These agricultural economists work closely with State agricultural experiment stations which also share a part of the expense of the cooperative studies.

The USDA scientific effort devoted to research in this area, including cooperative agents paid mainly from Federal funds, total 42.2 professional man-years. Of this number, 3.5 were devoted to dairy products, 6.8 to poultry and poultry products, 5.8 to livestock products, 6.8 to cotton, 1.0 to wool, 5.0 to grains and grain products, 1.5 to feeds and seeds, 1.0 to fruits and vegetables, 3.5 to oilseeds and peanuts, 1.0 to tobacco, and 6.3 to studies involving combinations of products.

REPORT OF PROGRESS FOR USDA AND COOPERATIVE PROGRAMS

Highlights of progress are stated below by commodity groups for all research studies for which reportable results are available. No statements of results are made on a few projects primarily for two reasons: (1) The projects were initiated recently in the reporting period and, while progress has been made, specific research findings and conclusions are not yet available. (2) A few projects were active for only a short time during the period, mainly to complete publication of research reports, the highlights of which were reported a year ago.

A. Dairy

1. Costs and Margins of Fluid Milk Distributors. Net receipts per hundred-weight of milk and cream processed by 80 selected fluid milk distributors declined from an average of \$11.37 in 1961 to \$11.17 in January-March 1962 and \$11.03 in April-June 1962, chiefly because of a shift from retail to wholesale sales and a decline of 7 cents per hundredweight in the cost of raw milk purchased.

2. Efficient Organization of the Southern Dairy Industry. For the Southwest group of States, the actual movement patterns for fluid milk and ice cream were quite different from what they were under programmed equilibrium conditions. The equilibrium movement patterns indicate a need for more specialization in the distribution from processing areas to markets. Projections of demand to 1975 indicate an increase of 35 percent over 1955 with considerable differences among States. The equilibrium conditions for 1975 based on projections of supply and demand indicate somewhat lower wholesale prices for fluid milk than in 1956.

With assembly of milk supplies under optimum conditions, costs could be reduced 10 to 25 percent in different markets, milkshed areas would be reduced in size yet adequate supplies would be available. However, such a change would necessitate considerable action on the part of producers and milk handlers.

A study of long-distance distribution of packaged fluid milk indicated that milk can be distributed at lower costs from local distribution center in the market served than by routes operated from the processing plant at distances over 100 miles from the processing point when the quart-equivalent units delivered are over 1,000 per day.

3. Capacity and Flexibility of Milk Manufacturing Plants. Preliminary investigations seem to indicate that plants with small milk volumes have limited flexibility. Larger plants seem to be more flexible but hesitate to alter the product mix unless price and cost factors appear relatively stable. Nonprice factors, such as availability of specialized labor and alternative markets, also contribute to the stability of the product mix.

4. Cottage Cheese and Frozen Dessert Costs. In 1960-61, costs for processing and marketing cottage cheese averaged 19.7 cents per pound and \$1.15 per gallon for frozen desserts in a sample of Kansas, Missouri, and Oklahoma fluid milk plants. Costs varied considerably among plants for both products. Much of the variation was caused by differences in costs for ingredients and for selling and delivery.

Profitability of handling cottage cheese and frozen desserts varied among the plants. All plants except one received a net profit on cottage cheese, and all except one received a net profit on frozen desserts.

B. Poultry and Eggs

1. Economies of Scale in Commercial Egg Packing Plants. Study of model egg packing plants under Southern conditions showed that costs decline from \$1.92 per case to \$1.45 per case as capacity is increased from 7 to 120 cases per hour. Preliminary analyses of egg contracting programs and other methods used to coordinate production and marketing operations indicate that highly integrated operations appear to have many advantages over non-integrated operations, particularly in meeting seasonal market requirements.

2. Commercial Hatchery Costs. Preliminary analyses of data from 30 egg-type chick and 27 turkey poultry hatcheries in 12 States show that operating costs per egg-type chick hatched are about 3 cents lower for hatcheries with large volumes than for those with small volumes. For turkeys, the difference was about 4 cents per poult. Seasonality of operations, use of obsolete equipment, combination of other services and sales functions with hatching, and low rates of performance are responsible for actual costs being above those for efficient model hatcheries.

3. Costs of Assembling and Processing Turkeys. Costs per pound in turkey processing plants decline under standardized conditions for all market classes as model plant capacity increases. However, most of the economies of scale can be realized by plants less than half as large as the largest model. For heavy young hens, these model plants can process 1500 and 4000 head per hour, respectively. Costs of assembling live turkeys are influenced by size of firm, density of the supply area, and performance efficiency in loading. Substantial savings can be realized in any size of assembly firm by standardizing operations and flock sizes and reducing the size of the supply area. Costs per unit of product increase with firm size (if density is constant), but not in proportion to volume.

4. Costs of Assembling Live Poultry. The live poultry assembly system in New England is changing rapidly. Newer types of firms, such as large processing plants, contract haulers, and contractors, have made tremendous gains at the expense of the older types and through extensive use of contract production. Margins for assembly have been reduced, but further substantial reductions are possible through increased efficiencies on the part of individual firms and further reductions in the number of firms engaged in assembling live poultry. About 330 New England firms assembled 470 million pounds of poultry in 1957 at a cost of \$4.6 million. These costs could be reduced to \$2.9 million through maximum efficiency in operations of each firm, eliminating overlapping procurement areas, and reducing the number of assembly firms by 60 percent so the remainder could operate at capacity.

5. Egg Margins. Farm-retail spreads for large eggs in ten cities averaged 24.2 cents a dozen in 1962--0.2 cent wider than in 1961. Retail store spreads were 0.5 cent wider, but farm-retailer spreads were 0.3 cent narrower. Egg prices were lower at all market levels. Farm-retail spreads for frying chickens in ten cities averaged 19.2 cents a pound in 1962--0.1 cent wider than in 1961. Retail store spreads widened 0.3 cent, but farm-retailer spreads narrowed 0.2 cent. Prices for frying chickens were higher at all market levels in 1962 than in 1961.

C. Livestock

1. Marketing Costs and Margins. A study of accounting records from large independent meatpackers showed about 7 percent of the average retail price of fresh beef went to cover costs to packers for slaughter, shipping and delivery services, compared with farmers' share at about 60 percent.

Allocation of these costs to labor, grading royalties and packaging, procurement and selling transportation and delivery were similar in amount and proportion in January-March 1963, October-December 1962, and the average for January-December 1961.

Retail meat prices appear to adjust to changes in prices of live animals only after lag of five to eight weeks. This lag was observed in the most recent drop in beef prices and appears to be of about the same magnitude as in similar circumstances in past years.

2. Costs of Slaughter. Summary of data from monthly accounting records for 1962-63 for large independent packers showed labor cost about \$1.50 per 100 lbs. of dressed beef; over one-third of packers' total processing costs of \$4.20 per 100 lbs. Shipping and delivery costs amounted to about \$1.05 per 100 lbs. and fixed overhead to another \$1.00. Local delivery and cost for procurement and selling averaged about \$.35 to .40 per 100 lbs.; transportation to distribution centers about \$.75 per 100 lbs.; packaging, grading and royalties about \$.20 per 100 lbs. Three-fourths of the packers reported costs for grading and royalties.

About two-thirds of labor cost was for slaughter operations, head and offal workup, and the chill cooler; about one-fourth for shipping cooler labor in loading out; and the remainder for hide-cellar operations.

No consistent cost differences could be attributed to size or location of plant, for this sample, but there was a wide range in costs for plants of similar size.

A break-even analysis of changing beef volume showed both that with varying buying prices and selling prices and with costs that vary with changing volume in varying patterns, most packers find that the volume range for profitable operations is narrow and income barely covers costs; attempts to increase profits expanding volume are likely to squeeze operating margins further.

Labor requirements in hog-killing operations ranged from about 1.4 head per man-hour to about 6.3 head per man-hour. Part of the variation is influenced by plant capacity. Most of the variation efficiency among plants seemed to be associated with physical factors such as varying equipment-labor combinations.

3. Livestock and Meat Movements in the Southeast. Apparently the movement of hogs in the Southeast is relatively efficient. The hog-pork industry can compete favorably with the Midwest under the current transfer cost structure. However, if hog slaughter costs in the Southeast increase to the level of slaughter in the Midwest, it will be more economical to ship pork to the Southeast than to ship hogs in for slaughter. In this case, the Southeast hog slaughtering industry will be more dependent upon local hog production.

D. Cotton and Cottonseed

1. Charges and Practices in Marketing Cotton. Frequent changes in the costs and organizational structure of the cotton industry give rise to a continuing need for current information on charges to producers for ginning and selected marketing functions and on trends for related services. In the 1962-63 season, the Beltwide charge per bale for ginning and wrapping upland cotton was \$17.08 and a record 70 percent of the crop was harvested mechanically. Comparable figures for the previous season were \$16.83 per bale ginning charge and 59 percent of the crop mechanically harvested. The average charges per bale were lower in 5 States in 1962-63 than in the preceding year but the increase in the quantity of seed cotton required per bale in some areas resulted in an increase in the Beltwide average. In 1952-53, the average charge was \$12.44 per bale and only 18 percent of the crop was mechanically harvested. Charges by public warehouses averaged 74 cents per bale for receiving and 52 cents per bale per month for insured storage in 1962-63. In the preceding season the same charge for storage prevailed, but the receiving charge was 6 cents per bale less.

2. Marketing Margins and Costs for Fibers and Textiles. Information on the competitive position of American cotton and wool, marketing margins and costs for cotton, wool, man-made fibers, and textile products, is needed as a basis for appraising the present position of the industry and to indicate means of improvement. Market outlets for American cotton and wool continue to be adversely affected by greatly increased competition from other fibers. Costs of ginning, handling, and merchandising cotton continued to increase to 1963. Farmers' share of the consumer's dollar paid for cotton and wool products in 1962 averaged greater than in 1961, but substantially less than in the early 1950's. Gross margins of manufacturers of cotton cloth decreased in recent years and averaged 12 percent of the consumer's dollar in 1961. Corresponding proportions for manufacturers of wool fabrics varied irregularly and averaged 15 percent in 1961. Similar proportions for manufacturers of apparel and household goods increased in recent years and averaged 31 percent in 1961. Margins for wholesale and retail distribution of textile products increased since 1947 and averaged 41 percent of the consumer's dollar in 1961.

3. Cotton Ginning Efficiency. Additional cleaning equipment in gins, necessitated by increased mechanical harvesting, declining volumes in some areas, and rising cost of variable inputs, have resulted in a sharp upward movement in average ginning costs and created an urgent need for reliable information designed to increase ginning efficiency in each major production area. Work in the past year indicates many wide variations between and within areas in power use and cost. A study in the Delta area indicates that approximately two-thirds of the variation in power cost was accounted for by variation in power consumed and about one-third by variation in cost per unit of power. About three-fourths of the variation in power use was accounted for by variation in number and size of fans, number of gin saws, number of lint cleaners, and amount of overhead cleaning equipment. Half the variation in power rates was accounted for by variation in total volume of power consumed in the gin plant. Studies in three western areas and in the Delta indicate that marked reductions in power use can be obtained without affecting the rate or quality of ginning through reduction in the number of fans or substitution of smaller-sized fans; through changes in operating practices to reduce idle time during period when plant equipment is not in operation; and through rearrangement of existing equipment with only moderate capital outlays to permit more efficient use of power.

4. Labor Utilization at Cottonseed Oil Mills. Cost of labor is the largest item of cost in processing cottonseed. Since trends in wage rates have been moving up for sometime, a study of labor-saving equipment and operating practices in various cottonseed oil mills will provide a valuable guide to processors to improve operating efficiency.

Data have been collected and an analysis of the labor use patterns for various types of mill operations is well underway. Although analysis at this stage is premature for arriving at definite conclusions, it is evident

that: (1) the screwpress is the dominant method of extraction both in number of mills and volume of seed crushed, and (2) labor use varies widely at all levels of production among all methods of extraction and the most critical labor variation areas are among the screwpress mills.

5. Cost and Efficiency in Cotton warehousing. Rising costs at cotton warehouses and increased stocks of Government-owned cotton give added importance to the need for information on inputs for receiving, storing, compression, outhandling, and transportation of cotton; the influence of labor, equipment, building, and other factors on the adequacy and efficiency of these services; and on plant and operating specifications for providing adequate services at minimum cost. Detailed investigations involving technical-economic methods of measurement and observation have been made at selected warehouses and analyses are underway of the effect of differences in handling practices and in the relative use of labor and equipment among plants in performing similar services at varying levels of volume.

E. Wool

1. Marketing Costs and Margins for Wool. Wool marketing may cost the sheep producer up to 30 percent of his income from wool. The marketing margins might be lowered considerably if more operations were performed in the producing area rather than in eastern markets. Research conducted under contract with the Ohio Agricultural Experiment Station is complete. Results of this limited study indicate only a slight net benefit from sorting of fleece wools in country warehouses. It appears desirable to sort "off wools" if sufficient volume can be obtained and to select out those fleeces during regular grading operations, which meet the requirements of the limited papermakers felt market. Analysis of data obtained from operators of wool scouring and baling plants in the Western States and selected wool scouring plants located nearer points of manufacture is complete and the results are being prepared for publication. The two most limiting factors affecting the feasibility of scouring wool in the producing area are transportation cost differentials of various locations and ownership of wool at the time of scouring. An equation to predict relative transportation advantages accurately was developed and suggestions are presented relating to methods of operations. The baling of grease wool appears desirable in all but the very smallest of warehouses.

2. Organization, Operation, and Efficiency of Wool Pools. Farmers in the fleece-wool areas (outside the Western States and Texas) who usually market wool in small quantities may benefit greatly if they market wool through local pools. They need information on how such pools should be organized and operated as a basis for action.

Mail questionnaires were sent to operators of all known wool pools in the United States for the purpose of obtaining information on volume of wool handled, number of producers served, selected methods of operation, services

and charges, and selling procedures. Preliminary results of analysis of these data indicate that the major problems facing the 235 local pools and their 34,000 members can be attributed largely to a lack of knowledge about, or communication with, wool buyers. Improvements in pool organization and operation are suggested incorporating the views of both the pool members and buyers. However, the problem of allocating returns to individual producers in line with the merit of their clip at a reasonable cost is common, and results of this study are not adequate to provide a satisfactory solution.

F. Grain

1. Marketing Margins and Costs for White Bread. Prices of many processed agricultural products--particularly bread--have continued to rise since World War II. Much of the rise is attributed to increases in cost of processing and distribution. Continued research is needed (1) to determine the magnitude of this rise, and (2) to find means to process and distribute agricultural products more efficiently.

Up-to-date analysis of price spreads for white bread indicate that bread prices continued to rise in 1962 to 21.2 cents per 1-pound loaf of white bread up 0.3 cent over 1961. Major findings in Miscellaneous Publication No. 712 and Marketing Research Report No. 623 were reported last year based on preliminary analyses. The final publications during the current year did not modify the findings reported earlier.

2. Cost and Efficiency in the Rice Milling Industry. The cost of milling rice is a key factor in determining the level of export subsidies for rice and the price supports to farmers for several varieties of rice. Up-to-date information on rice milling cost therefore is essential for a successful operation of public programs in the rice industry. Such information supplemented with cost standards of operation is also useful to management of rice mills to guide them towards greater efficiency of operation.

Progress during the year is indicated by (1) initiating, conducting, and completing a study of rice milling costs at the request of the Agricultural Stabilization and Conservation Service, (2) continuing the analysis and drawing up a draft of a report on labor standards in various phases of rice mill operations. Findings on rice milling costs were transmitted to the Agricultural Stabilization and Conservation Service in a short confidential report. Preliminary results of the analysis on labor productivity in rice mills suggest that labor is an important cost item in mill operations and that management could improve the efficiency of their plant operations by better utilization of labor resources.

3. Cost and Efficiency in the Elevator Industry in the Spring Wheat Area. The elevator industry in the spring wheat area, geared to pre-World War II marketing patterns, was forced to expand rapidly after the war due to shortened harvest period, increased production, and Government programs.

Expansion has not been orderly. Information is vitally needed by elevator management as to the most efficient use of resources, improvements in operating procedures and the rational allocation of costs among the segments of the enterprise. Progress during the year is indicated by the completion of an economic-engineering study (mainly of labor and power inputs) at 14 elevators. Terminals, sub-terminals, and country elevators were included. Observations were made twice at each elevator, once during the busy season and once during the slack season. Analysis of data is now underway.

4. Cost and Efficiencies in Bread Distribution. The retail price of bread has been rising continuously since World War II. Much of this increase has been attributed to the increase in cost of distribution. A study is underway to determine the cost and efficiencies of alternative methods of bread distribution. Progress under this project during the past year consisted of developing the necessary forms for collecting data for an economic-engineering study, complete the fieldwork, and begin to analyze data.

5. Cost of Operating Grain Elevators. The costs and charges for storing and handling grain in country and terminal elevators materially affects the cost of operation of price-support programs, returns to farmers, and incomes of elevator operators. Accurate up-to-date information on these costs and charges is essential for a successful operation of the price-support programs for grains. All fieldwork covering 45 country and terminal elevators has been completed and data assembled. The extensive field survey included time and motion studies of grain handling operations and personal interviews with management of grain elevator operations.

G. Feed and Seed

1. Cost and Efficiency in the Operation of Feed Mixing Plants. Mixed feeds production has increased greatly in recent years. At the same time, production facilities have been decentralized. Feed mill management badly needs information on production standards in various phases of feed mill operation to guide them in reducing costs in old mills and in planning to build new facilities.

A study by Iowa State points out that feed manufacturers have little profit motive for innovating feeder contracts. Although not all programs lost money for the feed manufacturers, on the average, the programs lost \$.87 per ton.

The report MRR-564 on the labor and capital for mixing feeds has used two models with cost data and standards obtained from survey. An outlay of about \$49,000 would be required to build an 80-ton, 8-hour feed mill. A larger mill with a 200-ton per 8-hour capacity would cost about \$80,000. If the smaller mill operated one shift annually, the operating cost would be about 80 cents per ton. With two shifts, this mill would reduce the

annual cost per ton to 70 cents. The larger mill, with a one-shift operation, would produce feed at an annual cost of 63 cents per ton. This mill, operating with two shifts, could reduce the cost per ton to 55 cents. If both mills produced the same amount of mixed feed annually, (52,000 tons), the larger mill would have about a 12 percent cost advantage.

The manuscript on packing mixed feeds also uses two models: One packs 65 tons, and the second packs 160 tons per 8-hour day. It would require 7.951 man-hours for the smaller mill to pack this amount at a cost of 39.3 cents a ton. The larger model takes 14.346 man-hours to package the 160 tons of feed at a cost of 29.8 cents per ton. With both models packing 42,000 tons of mixed feed a year, the larger model would have a 20 percent cost advantage. Both models' costs would increase about 18 percent if their percent of total feed mixed that was packed dropped from 80 to 30 percent.

A manuscript on the receiving cost center operations is now under preparation. Two models with 80 and 200 tons capacities are used in this study. The 80-ton model requires on the average 6.1 man-hours a day to receive 80 tons of incoming ingredients. In the 200-ton mill, 200 tons of incoming ingredients require about 12.97 man-hours per day.

2. Cost and Efficiencies of Commercial Seed Processing Plants. Seed production and processing has expanded greatly, especially in the Northwest as a result of increased demand for cover crops (stimulated by U. S. farm programs). Seed plant operators urgently need objective information on costs and related factors to guide them in expansion plans. A report on "Cost and Efficiency in the Operation of Oregon Commercial Seed Processing Warehouses" is being published. It indicates that the Oregon seed processing industry is dominated by many smaller plants and that the economies of size are not being taken advantage of by the seed processing industry. The report establishes through an economic-engineering method several model plants of different size as a guide to management of seed processing facilities to improve the efficiency of their operation. Different handling methods are analyzed for various types of grass seeds. Given a unique method of handling, a plant processing 1,000 tons of rye grass seed would incur a total operating cost of \$16.96 per ton against \$10.20 per ton for a plant which handles and processes 5,000 tons of rye grass a year.

3. Impact of Grain Banks on Feed Milling and Farming. Little is known about a new merchandising technique in the marketing of feed grains and mixed feeds. This technique, commonly called grain banking, became widespread in recent years in the Midwest. Information on its impact on the operating efficiency of the feed industry is needed to guide farmers and management of feed mixing plants towards more efficient methods of marketing. A grain bank is an arrangement between a local feed mill and a farmer whereby the farmer deposits grain with the mill for temporary storage and withdraws it in the form of mixed feeds. About 1,500 grain bank operators in Ohio, Indiana, Illinois, and Iowa were surveyed. It was found that the grain bank method of distributing feeds can render significant efficiencies

country elevator. The use of the grain bank permitted the elevator operator to schedule the feed processed, thereby increasing output by 75 percent with the same facilities and labor. The majority of the grain bank customers used services as: bulk delivery, shelling, drying, grinding, and mixing. However, the use of these services varied with the use of particular feeds as well as between different feeds. Grain banks were the busiest during the winter months and processed the least in the summer. Mill management emphasized the primary reason for starting grain banks was to increase concentrated feed sales. Customers liked the grain bank because of convenience, many services, and lack of storage space needed on the farm.

H. Fruits and Vegetables

1. The Cost of Packing and Storing Michigan Apples. Changes are taking place rapidly in the marketing of apples. These changes include new containers, packing techniques, and the expanded use of controlled atmospheric storage. Needed adjustments to these changing marketing conditions require current information on the costs of packing and storing apples. Under this new project, economic engineering analyses are planned for a sample of Michigan packinghouses to develop detailed cost and equipment standards for packing and storage operations.

2. Marketing Margins. Marketing margins, retail prices, and farm values for fresh fruits and vegetables each increased 3 percent from 1961 to 1962. The farmer's share of the retail price for fruits and vegetables remained unchanged at 34 percent. Margins and prices for processed fruits and vegetables decreased. The farm value was down 12 percent, the retail price 4 percent, and the marketing margins 1 percent. The farmer's share of the retail cost dropped from 23 to 21 percent. A study of marketing margins for Washington Delicious Apples sold in Chicago and New York City showed the largest component to be the wholesale-retail margin. This margin claimed from 37 to 54 percent of the retail dollar in Chicago, and from 34 to 48 percent in New York City.

I. Oilseeds and Peanuts

1. Marketing Margins for Fats and Oils. The major shifts in the utilization of various types of fats and oils in recent years created considerable marketing problems for agencies assembling, processing and distributing these products. A study of trends in marketing spreads for various fats, oils and oilseeds used in food and nonfood products provides valuable information to many farmers and marketing agencies to adjust efficiently to the changing conditions of markets.

Background information is being developed relating to the importance of various food products in the utilization of edible vegetable oils. Data

are also being compiled for estimating "farm values" for the oils that have recently come into wider use in food products. Retail prices arranged for the B. L. S. are now being regularly received. No findings are available as yet.

2. Marketing Margins for Peanuts in Peanut Butter. Peanut butter is the primary product made from peanuts. In 1960, retail prices of a 12-ounce jar of peanut butter averaged 41.8 cents, of which the grower received an average of 11.8 cents. This farm-retail price spread was divided as follows: shellers, 21 cents; manufacturers, 15.0 cents, wholesalers and retailers, 12.9 cents. Chainstore margins averaged 2 cents a jar below margins in other stores. Margins on minor brands averaged 8 cents a jar below margins on the major brands requesting, in large part, the higher cost of advertising and merchandising the nationally advertised brands.

3. Costs and Practices of Peanut Shellers. Peanut shellers are under considerable pressure to increase their efficiency and lower cost of marketing. The adjustment of the shelling industry has been to larger and fewer firms, and toward integration with manufacturers and distributors of peanut products and other foods. Shellers have also moved rapidly toward bulk handling and storing of farmers stock peanuts in all major producing areas. However, in the Southeast, this adjustment is far from complete.

4. Sheller Margins. A part of this project involves special research relating to the establishment of differentials under the price-support program for peanuts. The second phase, now nearing completion, involves the development of a uniform accounting system for peanut shellers. This accounting system will facilitate a more equitable determination of sheller margins for the several types of peanuts, and will aid shellers in their own efforts toward increasing the efficiency of their operations.

5. Commercial Utilization Pattern and Pricing of Peanuts. Under the price-support program, peanut shellers have a difficult problem in determining what qualities of peanuts they should endeavor to buy. Their problem is to determine the interrelation of kernel grade characteristics, the grade kernel support price, shelling costs, and the outturn of shelled grades to profits on a given lot of farmers stock peanuts. A linear programming model has been developed to determine the optimum quality of farmers stock peanuts that shellers should buy under varying assumptions and marketing conditions. Good progress has been made in obtaining the necessary data for the model including estimates of shelling costs. Results of this study also should be of considerable value to administrators responsible for establishing price supports.

J. Tobacco

1. Costs of Selling Looseleaf Tobacco. The efficiency in marketing and processing tobacco may be increased through selling tobacco in the loose-leaf rather than the tied form. This change in marketing practices has

important impacts at all stages of the marketing process, including pricing and the price-support program. As part of a study of this form of selling, a new packing frame and package was developed. The frame is rectangular in shape without a top or bottom and will hold up to 300 pounds of tobacco. A new material called knit paper was developed to contain the tobacco as it passed from the farm to the auction market and on to the processing plants. A total of 273 experimental packages or 36,700 pounds of tobacco were sold on 5 markets during the 1962 flue-cured marketing season. Advantages of the package are: (1) A reduction of about 100 hours farm labor per acre in packing loose leaves vs. tying the leaf in "hands"; (2) leaves are packed straight-layed with butts together, which is the most convenient form for loading the processing plant conveyors; (3) burlap or cotton sheets and wooden baskets are eliminated; (4) dumping the tobacco on to baskets at the market is eliminated, thus preventing damage by tangling the leaves which caused broken mid-ribs and reduced thrashing efficiency. Tobacco buyers and farmers both liked the package and prices received for the tobacco were very satisfactory.

2. Cost and Efficiency of Looseleaf Tobacco. Growers and marketing firms continue to have a strong interest in improvements in handling tobacco at auction warehouses so as to offset rising labor and other costs and to improve in other ways the efficiency of this important marketing operation. Preliminary results of this study, still in progress, indicate that institutional rigidnesses are a serious ban to the introduction of improved methods, particularly mechanization.

3. Margins and Costs for Tobacco and Cigars. Technological and other changes in the handling, processing, and manufacturing of cigars are having pronounced effects on domestic requirements and the demand for cigar-type tobacco. The consumption of cigars after several years of moderate increases appears to have reached a plateau at an annual rate of 7 billion cigars. Cigar manufacturers have mechanized more manufacturing operations and have increased production of "short filter" cigars and the use of sheet for binders and wrappers. They have also increased their advertising programs and the number of brands, shapes, and sizes of cigars as a means of expanding consumption. The use of tobacco sheet and the introduction of small sized cigars have reduced the quantity of tobacco needed to produce a given number of cigars. Manufacturers are also experimenting with new brands, some of which require increased imports of tobacco from the Philippines, Dominican Republic, and several Latin American countries.

K. General and Multi-Commodity

1. Marketing Margins, Retail Prices and Farm Share. The retail cost of the farm food market basket averaged slightly higher in the first half of 1963 than in the corresponding period last year. This increase resulted entirely from higher marketing charges, as prices received by farmers for food products were lower this year than in 1962. Most of the decline in the farm value of the market basket resulted from lower prices for beef

cattle, hogs, fresh vegetables, and fluid milk. The spread between the retail cost and the farm value of the farm food market basket rose sharply early in 1963. Much of the rise resulted from increases in marketing spreads for beef and pork, as retail prices of these products decreased less than farmers' prices of cattle and hogs. Marketing spreads also increased rapidly for processed orange products as retail prices moved up faster than farm prices following freeze damage to the orange crop. Nearly all of the increase in marketing charges was in the first quarter of the year.

The rise in marketing spreads and the decrease in prices farmers received reduced the farmer's share of the dollar consumers spent for farm foods in retail food stores to 36 cents in the second quarter this year, the smallest share since the 1930's.

The bill for marketing farm-originated food products in 1963 is expected to total about \$45.5 billion, up 6 percent from the preceding year. This rise resulted about equally from increased volume and higher unit marketing charges. Farmers are expected to receive about the same or slightly lower returns from these food products this year than in 1962.

2. Labor Productivity in Marketing. Increased output per man-hour has kept labor costs per unit of food marketed from rising as much as hourly earnings in recent years. Though hourly earnings, including allowances for fringe benefits, jumped 51 percent from 1952 to 1962, unit labor costs increased no more than 16 percent. Gains in output per man-hour are attributed mainly to technological improvements in marketing facilities and in production and distribution practices, to increased skill and capability of management and workers, and to economies of scale.

3. Fringe Benefits and the Marketing Bill. Fringe benefit payments are sizeable and are becoming an increasingly important part of the food marketing bill. They rose from \$222.1 million in 1954 to \$474.7 million in 1960 for food and kindred products, manufacturing, wholesaling, and retailing. During the same period, fringe benefits increased 169 percent compared with 34 percent increase in wages and salaries. Research underway is testing functional relationships between wages, sales, profits, depreciation, and other accounts.

4. Costs of Curing Hides. The completed analysis of several hide curing methods indicates that the volume of hides cured in a plant is important in choosing the most efficient method of curing. Pack-salt curing is the lowest-cost method for plants processing fewer than 300 hides a day. The agitated-brine method is slightly more efficient at daily volumes of 300-500 hides, and for larger firms the agitated-brine method definitely is the least costly method. The costs of fleshing were estimated at 16 cents per hide with a volume of 400 hides daily, but only 12½ cents with a volume of 1,000 hides a day.

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AREA 7

MARKET STRUCTURE, PRACTICES AND COMPETITION

Problem. Most agricultural processing industries continue to experience rapid and drastic changes in their market organization and their marketing and merchandising practices. These changes affect both farmers and consumers. Research is needed to keep abreast of such changes and to indicate their probable consequences. Continuing changes in structures and practices alter the basic economic functions for which markets are responsible and involve both technical and economic efficiency. Additional studies are needed to determine differences in impact among commodities as well as upon basic factors such as pricing and costs.

Increasing concentration, changing institutional patterns, and shifts in marketing channels and practices have created a new economic climate in which the farmer must live. As a basis for rational adjustments to this changing environment, information is needed (1) to indicate impacts of vertical and horizontal integration, other changes in market structure or marketing practices, and the development of new institutional arrangements upon farmers' bargaining position and income and upon the effectiveness and efficiency of the marketing system; and (2) to determine types of public action which would be most effective.

The competitive positions of many commodities, producing areas, and marketing firms are changing under the impacts of shifts in the location and technology of production, changes in demand and location of population, changes in transportation, processing, and marketing methods, development of new products, and changes in agricultural programs. Analyses of marketing aspects of interregional and interproduct competition in agriculture are required to guide public policy and the decisions of farmers, marketing firms, and others in making essential production and marketing adjustments.

USDA PROGRAM

The Department has a continuing long-term program of economic research to assist farmers and marketing agencies to adapt to changes in market structure, practices and competition. Work in this area is conducted at Washington, D. C., at field offices in Berkeley, California and Denver, Colorado, at 20 experiment stations under cooperative agreements or contracts, and by a private firm under contract. The Federal scientific effort devoted to economic research in this area totals 42.4 professional man-years, distributed as follows: beef cattle 1.7, dairy 5.3, poultry 4.8, livestock 4.1, cotton .9, grain .7, feed and forage .3, sugar 2, citrus fruit 3, deciduous fruit and tree nuts 4.5, potatoes 1.8, vegetables 4.5, hides, skins and leather .1, and cross-commodity studies 8.7.

REPORT OF PROGRESS FOR USDA AND COOPERATIVE PROGRAMS

A. Dairy

1. Price Wars in City Milk Markets. The study has provided a fairly clear understanding of the causes of retail milk price wars as part of the competitive conditions in city milk markets. It has helped to identify certain functional aspects of some price wars, including: (1) The stimulation of technological innovation; (2) assisting the entry of new firms; and (3) helping to bring outmoded structures of prices into a more realistic relationship to changed conditions. In an effort to retain the viability of competition (including price competition) among dairy firms while mitigating the clearly destructive aspects of over-intense competition and prolonged price wars which have plagued many city markets, recommendations are being prepared with respect to improvements in: (1) Competitive tactics of the individual firm; (2) strategy of the industry of a city market for more orderly revisions of price structures; and (3) improved public policies.

2. Drive-In Dairies in California. Drive-in dairies increased their share of Class I milk sales in Central California from 1.8 percent in January 1957 to 6.4 percent in January 1962. It declined to 5.8 percent by January 1963, with the reduction in the price differential between drive-ins and grocery stores. Major factors contributing to the growth of drive-ins were: (1) The price differential allowed under State minimum price regulations; (2) the efforts of producers to obtain outlets for Class I milk under the California milk classification regulations; and (3) changes in the shopping habits of consumers. Growth of drive-ins in many other areas of the country is likely to be slower than in California because of differences in the first two of these factors.

3. Structure of the Midwest Dairy Industry. Analysis of background data including trends in geography of milk and cream supplies showed that from 1939 to 1959 density had increased most in and around the most concentrated production area (centering in Wisconsin), though also in Southwestern Missouri and Central Kentucky. Decreases were most pronounced in the Corn Belt and in the Northern Plains States.

Census and Federal milk order data were used to estimate trends in numbers and sales volume of dairymen selling Grade A milk, manufacturing grade milk and farm separated cream. Declines in numbers of dairymen selling these products were especially sharp for farm separated cream and for manufacturing grade milk east of the Mississippi River. Increases in average volume were greatest among Grade A milk sellers.

The pronounced shift in the region from sale of cream to sale of whole milk reflected increased use of whole milk in butter manufacture as well as a decline in the relative importance of butter. Bulk handling has increased sharply throughout the region, contributing to a sharp decline in country receiving stations in the nearby zones of large milksheds.

B. Poultry

1. Pricing Eggs. Preliminary study indicates that the most commonly used base price quotations are those for New York City, Boston, Chicago and Los Angeles, with some overlapping between the areas in which they are used. In general, these quotations move together through time, although there are variations from day to day in the movements in various markets. Recommendations of members of the trade for improving the base price quotation system and for alternatives to it have been summarized and will form the basis for further research.

2. Egg Procurement by Large-Volume Distributors. Large-volume retailers are continually seeking sources of the lowest cost eggs consistent with the quality image they are trying to project. They must do so to remain competitive with other large-volume retailers. Thus, the producer-to-assembler-distributor-to-retailer marketing chain has become the most popular because it meets the competitive requirements of the retailers. It is much shorter than the older marketing chains and it may be indicative of the direction of future trends. Already even shorter marketing chains are being tried in various sections of the country. This is occurring where producers have volumes large enough to economically do the candling and cartoning functions on the farms and meet the requirements of individual retail stores of the large-volume retailers. Considerable analysis has been completed of the impact on procurement systems of production, distribution, and institutional considerations. Further analysis will be made of the impact on procurement systems of the retailer's and of the supplier's positions and objectives.

3. Integration in the Turkey Industry. Integration in the turkey industry is not as prevalent as in the broiler industry and has a wider range in types of integration. While contracting is the main form of integration, in some areas integration through ownership accounts for a substantial part of the production. This ownership may be by individuals or by closed stock corporations. Part of this study included an analysis of material on the extent of risk-sharing type contracts in 1961. Approximately 25 percent of the total U.S. production was under risk-sharing contracts, with the Western Region having almost 40 percent under risk-sharing contracts and the North Atlantic Region showing less than 5 percent under such contracts.

4. Changes in Marketing Eggs. Preliminary analysis of a New York egg marketing survey for June 1963 indicates that since the June 1959 survey: (1) Large-volume retailers have generally discontinued their candling and cartoning operations, and now receive eggs in cartons at their central warehouses or have them delivered direct to their retail stores; (2) the South has become a major source of supply for eggs in the New York market; and (3) in New York, Pennsylvania, and New Jersey, flexible formula differentials between farm prices and the New York spot quotations narrowed.

5. Special Sales of Fryers. Typical special sales prices for fryers featured in newspapers in ten cities averaged about 11 cents a pound lower than non-sales prices reported by BLS for the same cities in 1960-61. Advertising apparently had a significant effect on the increased volume of fryers sold by retailers--some sold more than three times as many fryers during special sales weeks as during nonsale weeks. Quantities of fryers sold could be increased with little or no change in price, if the commodity were advertised. A reduction of 1 percent in price without advertising resulted in an average increase of 1.75 percent in sales; with advertising, sales increased an average of 1.91 percent.

C. Livestock

1. Wholesale Marketing Channels. Marketing channels for wholesale meat distribution in the United States have been described and changes in the structure in the wholesale market evaluated on the basis of data from the Census of Manufactures. The decline in the importance of packer branch houses observed since the 1920's appears to be continuing at the same time independent meat wholesalers are becoming more important in the wholesale channels for meats.

2. Specification Buying of Meat. Of 1375 chainstore and independent retailers interviewed in Maryland, West Virginia and New Jersey, only 7 reported use of contracts with farmers or livestock feeders. About one-half of the retailers reported specifying grade, Federal or State inspection and sex when purchasing meat; nearly all specified weight range and cut, delivery date, price or pricing basis and method of payment.

3. Structure of Texas-Oklahoma Livestock Economy. Except at retail, not many changes in the structure of the Texas-Oklahoma meat industry are evident. However, substantial changes will be required in the near future. Sharp changes in meat retailing and wholesaling have caused changes in procurement practices. Fed livestock are increasingly in demand. As the Texas-Oklahoma livestock-meat economy moves to accommodate the changes in livestock feeding and slaughtering, the number of slaughtering firms will continue to increase, and plants will be larger in size. Fewer wholesaling firms will be required, but those remaining will be larger.

4. Structure of Livestock Slaughter. Livestock slaughter has become less concentrated in the hands of the 4 and 8 largest firms. This is true for all species and for amalgamated livestock slaughter. Slaughter plants have also become more specialized. Plant and firm entry and exit vary considerably from year to year, but in each of the past 12 years new capacity has been greater than the capacity withdrawn.

5. Pricing Livestock. Annual and semi-annual econometric models of price determination in the beef and pork sectors have been developed and tested. Projections have been made to 1960-1975. Beef production has been disaggregated into fed, nonfed, and dairy components. Interregional least cost of transportation flows for 1955 and 1965 for feeder and slaughter cattle.

The daily pricing process of packer buyers and commission firms have been observed at Denison, Iowa, and East St. Louis. Representatives of meat-packing firms have been interviewed regarding daily pricing operations. A panel of 80 livestock producers have been contacted.

D. Cotton

1. Pricing Cotton. The United States cotton's competitive position would be strengthened by helping bring about a pricing system which more accurately and effectively reflects the true use value of U. S. cotton, taking into account such fiber properties as fineness, strength, and maturity as well as grade and staple length. Following the mid-1962 interviews with large proportion of Texas shippers, those considered most able and willing to cooperate were sent three questionnaires at intervals from December to May, calling for their best judgment of the weekly average sales price fineness differentials for selected quality combinations of Texas High Plains cotton. Considering the complications involved in quoting on a three-dimensional basis, the results were surprisingly good. Stimulated and aided by the work under this project, the quotations committees of the Dallas, Houston, and Lubbock cotton exchanges began quoting "unofficial" fineness differentials during the first quarter of 1963. However, it is significant that most of the later are "applicable to all grades and staple lengths" and presumably to any U.S. Upland cotton sold on these exchanges. This may account for at least some of the substantial variations between the average differentials obtained by questionnaires and those quoted by the three committees. These and related marketing practices of Texas shippers are being given considerable attention in a comprehensive report now underway.

E. Tobacco

1. Canadian Tobacco Auctions. In selling tobacco, the Canadians use the "Dutch Clock" system which is markedly different from the auction system of selling in the United States. The study in cooperation with the Ontario Agricultural College was undertaken to see if any features of the Canadian system might be adaptable to the marketing of tobacco in the United States. The selling charge to growers of flue-cured tobacco in Canada during the past 30 years was \$1.00 per hundredweight. The average charge on auctions selling flue-cured tobacco in the United States during the same period was \$1.77. Also, the charge to the Canadian growers covered much of the cost of inspection for grading, a 2 cent levy for price-support operations, and the expenses of the Ontario Flue-Cured Marketing Board.

F. Grains

1. Structure of Northeastern Grain Markets. The structure of the Northeastern grain markets has changed rapidly in recent years creating marketing problems for many agencies engaged in handling, processing and distribution of grain and grain products. Research on changes in trends in grain markets

in the Northeast is designed to provide the industry with basic data to make optimum adjustment to changing conditions.

Progress during the year is indicated by completing all necessary work to obtain needed data for the analysis. Information obtained through mail surveys and personal interviews is now being tabulated for data processing. Some 1,500 grain handling and processing facilities were covered. No findings are yet available.

G. Feed and Forage

1. Storage of Sorghams. The rapid increase in sorghum grain production during the 1950's and government programs changed marketing patterns and required additional storage capacity. Findings show that on-farm storage increased from 9 million bushels in 1953 to 53 million bushels in 1960; about two-thirds of the sorghum grain is sold at harvest in the Coastal Bend due to early season price advantage, while in other areas there is greater tendency to sell at a later date; three-fourths of the farmers in the Coastal Bend who store sorghum also have drying and aeration facilities while less than 10 percent of the farmers in other areas have driers and aeration equipment. Commercial storage capacity of almost 650 million bushels in 1960 is more than double the 1955 space. Sorghum grain occupies about 75 percent of this space. There is a wide variety of types of storage and methods of storing although both are rapidly becoming standardized.

2. Pricing Forage. There is almost no marketing structure for forage. Lack of pricing in a common market results in inefficient pricing and produces price differentials that have no economic basis. The result is that forage is not moved efficiently. Little or no relationship exists between price and Federal grade, price and protein content, or between price and any of the factors of cutting, seasonality, quantity of hay sold, and type of buyer. Although in general, average prices for U.S. No. 1 alfalfa hay exceeded the prices for U.S. No. 2, U.S. No. 3, or Sample grade alfalfa, the differences were less than expected. In Washington State, one lot of U.S. No. 1 alfalfa sold for \$18 per ton while U.S. No. 2 alfalfa sold for as high as \$28 per ton. Also, in Nevada the average price of U.S. No. 2 alfalfa exceeded the price of U.S. No. 1 alfalfa.

H. Sugar

1. "Eastern" Beet Sugar Marketing Problems. Beet sugar growers and processors in Michigan have a strong interest in an evaluation of the competitive position of sugar beets, molasses, and beet pulp, produced by the "Eastern" sugar beet industry. They also need information on improvements which will assist producers, processors, and others in adjusting to changes in marketing conditions. Partial results of this nearly completed study indicate that under recent price relationships sugar beets possess considerable advantages over alternative crops available to farmers in the area.

However, other competitive conditions in this sugar producing area are unusually severe and these may limit the increase of sugar production in the area from that which might be expected.

2. Economics of Marketing Sugar. A slow decline in the relative proportion of sugar and an increase in the use of corn sirup as a sweetening material has occurred in most food industries since World War II. The use of non-caloric sweeteners by soft drink bottlers is increasing rapidly. Lower costs for corn sirup and non-caloric sweeteners relative to sugar are important factors causing these changes.

Dextrose and corn sirup are accounting for increased proportions of the increase in industrial use of caloric sweeteners. During 1952-56, they accounted for 10 percent of the increase; by 1956-61, to 27 percent. If this rate of gain over sugar continues, by 1981 all the gain in industrial use will be by dextrose and corn sugar. The results of this study indicate the need for rigorous economic evaluation of the current phase of this industry, and public policies relating to sugar prices, production, and marketing. Such an evaluation is now in progress.

3. Marketing Industrial Molasses. Molasses in each of its major uses is subject to effective competition from alternate raw materials. In livestock feed, other materials may be used. In most chemical uses, petroleum gases or other materials may be used to produce identical products. This substitution limits the price response of molasses to smaller supplies. Work on this project was initiated only recently.

I. Fruits and Vegetables

1. Competitive Position of the Western Fruit and Vegetable Processing Industry. The competitive position of the Western processing industry is affected considerably by intense competition from areas nearer major markets. Prices of many input factors, particularly labor and transportation, are higher in the West.

A comprehensive analysis of operating costs for multiple-product processing of selected vegetables by freezing shows that cost savings of from 10 to 20 percent are possible when compared with single-product plants.

The effect of length of operating season and plant capacity rate on total and average planning costs are presented. For example, one analysis shows cost savings of \$20 per 1,000 pounds in a multiple-product plant with an operating season of 2,000 hours over single-product plants for each of the commodities.

2. Changes in Structure of Wholesale Fruit and Vegetable Markets. Direct buying of fresh fruits and vegetables from shipping points by retail chains, together with increased prepackaging, have had serious effects on the structure of the wholesale market for fresh produce.

A final report summarizing changes in the structure of 52 wholesale produce markets has been completed. Direct purchases from shipping point by chains and affiliated groups increased from 12 percent of total market receipts in 1936 to 26 percent by 1958. During this same period the number of produce wholesalers decreased by 15 percent.

There is a shift toward more specialized markets for fruits and vegetables as reflected by changes in the types of fruit being handled by auctions located in terminal markets and by the increase in consumer packaging. In addition, in the produce industry there is a shift in emphasis from "trading" to "merchandising." Many firms are giving emphasis to performing marketing services contributing to orderly marketing rather than attempting to profit from short-term changes in prices.

3. Lower Rio Grande Valley Fruit and Vegetable Market. The U. S. House of Representatives and the fruit and vegetable industry of Texas have requested an evaluation of the structure and performance of the fruit and vegetable market in the lower Rio Grande Valley of Texas.

An analysis of the tomato market shows a highly competitive shipping-point market. An analysis of prices paid by chain and nonchain buyers shows no significant difference.

A comparison of prices received by growers with those reported by Market News found that the range of Market News prices reported included a large majority of the volume sold. For prices received by shippers, however, the upper point of the range of Market News prices was a better indicator of the high price than the low point of the range was in reflecting the low sale price.

A comparison of the change in packing cost associated with changes in quality of tomatoes when related to the spread between prices paid growers and the prices received by shippers (f.o.b.) showed the two to be closely related. This indicated a high degree of pricing efficiency.

4. Changes in the Structure and Performance of the California Fruit and Vegetable Industry. Changes in the market structure and practices in marketing fruits and vegetables grown in California require producers, shippers and wholesalers to adopt lower cost methods and practices.

Particular attention has been given to an examination of the assembly and distribution of fresh fruits and vegetables including mode of transportation and composition of shipments. From 1955 to 1961 transportation of fresh fruits and vegetables shipped out of California by truck increased from 20 to 30 percent of the total volume. In 1961, shipments in mixed loads accounted for 65 percent of all trucks inspected at border stations--averaging 5.5 different commodities per load.

5. Marketing Agreements and Orders. While Federal market order programs have operated for many years, little economic analysis of their operations or results has been made. Guides are needed for determination of the usefulness and probable effects of selected market order provisions for various commodities and marketing conditions.

Activity has been confined to preliminary investigations with respect to the five currently active Irish potato orders, the date order, and the suspended Florida tomato order. Questionnaires have been prepared for interviews of potato and data market order managers and administrative committee members and a sample of Florida tomato producers and handlers. Available secondary data concerning the potato and date orders are being studied.

J. Citrus Fruit

1. Competitive Relationships in Marketing Citrus Products. Serious marketing problems confront the citrus industry resulting from production in excess of demand.

In a study of competitive practices in marketing Florida and Texas grapefruit, buyers in eight major Midwestern markets thought increased production in Texas would affect Florida Interior more than Florida Indian River fruit. We can expect intense competition in marketing grapefruit as production increases.

A study of demand relationships for Florida and California Valencia oranges found no statistically significant substitution between fruit from the two areas. A 1 percent change in relative prices brought a 3 percent change in the relative quantities sold.

2. Structure of the Citrus Industry. Projections of the structure of the Florida fresh citrus industry to 1970 using both Markov chain and regression methods suggest fewer packer-shipper firms unless season average volumes double by then. Projections of size distribution generated from transition probabilities indicate that an increasing share of the total volume will likely be handled by the large firms.

K. Deciduous Fruits

1. Competition in the Red Tart Cherry Industry. Tart cherry producers in the Great Lakes States have been faced with difficult marketing problems. Underlying these problems are a declining demand, a highly fluctuating supply with an upward trend, and resulting declining and unstable prices.

Price, production cost and processing cost analyses, and a study of the implications of the European Common Market to fruit and vegetable industries have been made. The price analysis showed that a supply change of one-tenth pound per capita (raw product weight) was associated with an opposite direction price change of 50 cents per hundred pounds of tart

cherries (processed). The trend of tart cherry prices since 1947 has been down. Production cost analyses in Michigan, New York, and Pennsylvania indicate a wider divergence of costs within producing areas than between areas. The major producing State, Michigan, does not appear to have a production cost advantage. Estimates of processing costs have been made by plant stage. A new mechanical sorting machine is shown to be cost reducing only in plants operating for unusually long seasons. While the European Common Market is expected to decrease its imports of our farm products, the effect on tart cherries will be relatively small because these countries have taken few tart cherries in the past.

2. Organization of the California Deciduous Fruit Industry. Technological changes in marketing practices affect the structure and performance of the fresh produce industry and the competitive position of major producing areas. Technological changes are being adapted rapidly because of the large amount of labor required in handling and packing.

A research team composed of pomologists, physiologists, engineers, and economists is studying various methods of packing peaches, nectarines, and cantaloups from the standpoint of relative costs and quality. Indications are that cost savings with a "tight-fill" pack compared to the conventional place pack amount to as much as 15 cents per lug. Savings in labor alone were estimated to be 10 cents per lug. With savings of this magnitude, efficient plants could be modified with tight-fill equipment and have a "pay off" period of less than one marketing season.

From the quality standpoint, laboratory tests and trial shipments show that the tight-fill pack is equal to or better than the conventional place pack on arrival at market destination.

3. Variations in Apple Prices. Variable apple crop size from year to year and technological and economic developments are having serious impacts on apple marketing. Rational allocation of apples between fresh and processed markets and through the shipping season requires reliable information regarding prices and price elasticities.

The U. S. season average farm price of canning and freezing apples can be estimated by using data which are available early in the marketing season. Information on crop estimate, processed stocks, farm price of fresh apples, and a trend variable explained more than 90 percent of the variation in deflated farm prices of processing apples from 1951 to 1961. The demand for all apples sold from July to November, the harvest period, was inelastic. The results suggest that demand for fresh apples is slightly more inelastic than the demand for processing apples during this period. Fresh apple sales, lagged fresh price, sales of competing fruits, and income accounted for 92 and 84 percent of the variation in fresh apple prices in the periods of December to March and April to June, respectively. Demand was slightly inelastic in the December to March period, but slightly elastic in the April to June period.

L. Tree Nuts

1. Marketing Pecans. The pecan industry has been hampered by lack of knowledge concerning the structure of the industry, annual supplies and prices, the competitive position of pecans relative to other tree nuts, and data for planning by the industry.

Increases in pecan production were greater than population increases until the late 1940's, paralleled population growth until the mid-1950's, and have increased more slowly than population since then. Production is expected to increase at less than the population rate until about 1971, then increase more sharply. It is estimated that the price elasticity of demand for pecans is approximately -1.4. Thus, with a strong demand for pecans and other edible tree nuts, and little change in per capita supplies of pecans over the next decade, combined with a likely increase in consumer income, the outlook for pecan prices (and the pecan industry) is good.

A study of the pecan nursery industry disclosed that sales of pecan trees doubled between 1958 and 1962. The tremendous increase in the number of pecan trees propagated, assures a greater expansion of pecan production in the years ahead than had been calculated from time-series data. It is also indicated that a larger proportion of the total crop will come from improved varieties, now about 50 percent of the total.

M. Potatoes

1. Structure of the Red River Valley Potato Market. The purpose of this new project is to evaluate the structure and performance of the market for potatoes in the Red River Valley producing area. Primary attention is being given to those factors affecting prices and price variations and to the impacts of potato processing plants on the industry in the Valley. Detailed plans for the study have been made, but research results are not now available. This project will utilize the results of a similar project in the Idaho producing area, results of which were previously reported.

N. Vegetables

1. Marketing Vine-Ripened Tomatoes. Marketing vine-ripened, winter green tomatoes is relatively new and has had a significant effect upon the operation of tomato repacking operations in receiving markets. Vine-ripened tomatoes provide an opportunity for wholesale firms (other than tomato repackers) to compete with repack tomatoes. About half of the receivers of tomatoes in major Midwestern and Eastern markets regarded the current system of grading vine-ripened tomatoes as inadequate. Two-thirds of these receivers reported that a major marketing problem was the wide variation in color among lots within a shipment. Most receivers believed that rigorous control of maturity together with more color uniformity would improve the efficiency of marketing tomatoes. These problems suggest a need for more

coordination between producers and shippers in harvesting, handling, packaging and marketing so as to better satisfy market demand for vine-ripened tomatoes.

O. Hides, Skins, and Leather

1. Supply and Demand for Leather and Substitutes. The prospective supply of hides resulting from increasing rates of slaughter of domestic livestock will require greatly expanded domestic and foreign markets for hides, leather, and leather goods. Unfortunately, for the hide and leather industries, and indirectly for livestock producers, leather and leather products are experiencing increasingly severe competition from substitute products. If present trends continue, 60 percent of U. S. shoe production may be made of non-leather materials by 1970. Also, by this year, with a decreasing domestic demand for leather, perhaps as much as half of our total hide supply estimated at 34 million hides may have to move into foreign outlets. A major technological breakthrough in tanning appears to offer the greatest promise for making leather more competitive, pricewise, with substitute products. Reducing the costs of curing hides may help some. The value of hides and skins at the packer level is estimated to be about 4 percent of the retail value of leather goods.

P. Cross-Commodity

1. Consolidation, Integration and Mergers. The major factors in supply industries that are associated with integration of corporate food retail chains into the supply industries were found to be (1) concentration, (2) minimum optimum plant size, and (3) intensity of advertising. The main effect on supply industries of retailers and wholesalers undertaking integration into private label merchandising has been partial neutralization of market power of manufacturers, particularly power they had developed through product differentiation. In Wisconsin, own-label sales of small and medium sized canners declined since World War II from more than a fifth of sales to less than 1 percent.

2. Retail Pricing. Prices have been gathered twice weekly in 32 establishments in two communities for a period of a year. In addition, ads have been obtained in eight communities selected for their comparability. Preliminary findings suggest that for nonprocessed commodities, such as fresh oranges, grower prices quickly reflect changes in basic supply conditions caused by such factors as unexpected freezes. In such situations, processing prices to growers may lag temporarily because of the dumping of frozen fruit on the market for emergency salvage operations. Processor prices quickly reflected the changes in supply at the grower level to the retail level and the retail prices quickly reflected the change in processor prices. The chains and affiliated groups responded most rapidly to processor price changes. Price changes of these stores appeared to follow the processor price almost perfectly, after a lag of approximately a week.

Work at Iowa State University is attempting to assess the role and impact of nonprice competitive practices by developing a basic econometric model to determine, given certain factor inputs, what demand response to a given type of nonprice offer tactic ("variation") can be anticipated for super-markets in different market settings.

3. Taxes and Depreciation

Taxes paid by firms engaged in processing and distributing food increased more rapidly in the post-war period than the marketing bill as a whole. Taxes, including Federal income taxes, amount to about \$2 billion or about 5 percent of the marketing bill. Taxes per dollar of sales of food processors and retailers have risen at about the same rate but taxes per dollar of wholesalers' sales increased less rapidly.

Depreciation associated with the use of rapid methods is new. About one-fifth of total depreciation. A decline is anticipated in the future as low depreciation from the latter parts of depreciable lives, offset high depreciation on new assets.

A close association was found between new purchases of depreciable property and total cash flow, less cash dividends. Depreciation alone, appeared more closely related to replacement of depreciable property. Net increases in depreciable assets followed trends in retained earnings.

The capital IRS' new guide lines in estimating service lives of depreciable property will tend to further increase the rate at which assets can be depreciated. The tax credit will reduce current depreciation but not sufficiently to outweigh the thrust from widespread adoption of the new guide line lives.

4. Capital

Key ideas were developed relating to the financial aspects of firm size. Findings support the general thesis that many of the changes in business organization of farm and marketing activities can be understood as accommodations of the need to mobilize capital for modern, technically proficient operating units. The main financial benefits of size are to borrow funds more readily and at lower interest and to achieve a better balance of enterprise. An hypothesis developed for further study is that financial advantages of scale usually rest with larger firms while the production and distribution economies usually rest with lesser firms. If this were not so, many industries might become progressively more concentrated.

PUBLICATIONS REPORTING RESULTS OF USDA AND COOPERATIVE RESEARCH

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AREA 8

INFORMATION, OUTLOOK, AND RURAL DEVELOPMENT

Problem. Current marketing information and outlook are critically important to the efficiency of markets. Such information is used widely and intensively by farmers, marketing firms, and public agencies as aids in making many important decisions greatly affecting farm outputs, markets, marketing operations, prices, returns to growers, and expenditures of consumers. This information is also used in many ways and for many important purposes by public agencies, research organizations, extension workers, trade groups and others. Marketing information gathered and published by the Department facilitates communication among buyers and sellers and serves as the primary factual foundation of economic analyses of marketing conditions and outlook statements and forecasts.

In recent years the difficulties of providing useful marketing information have increased enormously. As production and marketing conditions and practices change, as shifts in the location of producing areas, markets and marketing operations occur, as the character of products, marketing firms, processing, and transportation methods are altered, and as the structure and performance of markets change, the need for changes in the nature, location, and volumes of market information becomes great. Traditional reports may become obsolete; new or greatly revised reports may be required; and changes in sources and methods of data collection may become necessary. The problem of adjustment of information services to changing market needs requires continuous study.

Future growth in population and demand, changes in product mix and sources of supply, changes in input-output relationships in marketing and introduction of new technology and products will cause major changes in the character and quantity of resources needed in marketing and the way in which the marketing functions are performed. Research is needed to indicate the probable situation in the intermediate future (about 5 years) and long term (10-20 years) to enable marketing firms, farmers, and Government agencies to plan their operations intelligently so that the adjustment to new conditions can be made in such a manner as to promote economy in the marketing of agricultural products, provide consumers with products they desire, and aid farmers in finding markets.

Rural communities depend upon marketing and processing facilities to prepare and sell products they grow and provide expanding employment opportunities. Continuing research provides the information needed to assess which proposed new investments will be economically feasible for operation within particular communities and for markets of specified size and to improve the efficiency in assembling, processing, wholesaling, and retailing operations of existing establishments.

Means are needed to achieve a more adequate utilization of labor and other resources either by providing new off-farm employment opportunities for rural residents or by facilitating resource adjustment through improving market outlets for products produced in low-income farm areas.

USDA PROGRAM

The Department's research program concerning marketing information, outlook, and rural development includes situation and outlook reports concerning prices, costs and margins, employment, marketing services, market structure, means of collecting and disseminating market information, and feasibility of investments in rural areas.

The Department's continuing program of economic research relating to marketing information, outlook, and marketing aspects of rural development is conducted mainly at Washington, D.C.; work on marketing information is conducted at Baton Rouge, Louisiana, Manhattan, Kansas, Columbia, Missouri, Madison, Wisconsin, and University Park, New Mexico; and work on long-term outlook at Berkeley, California, and Corvallis, Oregon.

The Division devoted 13.2 professional man-years to study information, outlook, and rural development in fiscal 1963 distributed as follows: 1.0 to dairy, 1.0 to wool, 1.0 to grain, 1.0 to cotton, 1.0 to horticultural crops; cross commodity--5.7 to information, outlook, and projections and 2.5 to rural development.

REPORT OF PROGRESS FOR USDA AND COOPERATIVE PROGRAMS

A. The Effects of an Experimental Milk Price Reporting Service

Prior studies showed that of 543 sellers of milk approximately 53 percent knew the price paid by current buyers. Because of such findings an experimental price reporting service was designed to test two major hypotheses: (1) the price information, which allows a dairy farmer to compute the net paid price of his own and alternative price of buyers or raise his level of knowledge of his own and alternative prices, will make him more price responsive and (2) the increase in dairy farmer's level of knowledge of base prices, fat differentials, and hauling charges will bring about some alteration of competitive practices of the milk-buying firms.

To test these hypotheses a control area and experimental area were established within the same basic Wisconsin milkshed. Price reports were mailed monthly for eight months to farmers in the experimental area. Farmers in both experimental and control areas were interviewed shortly after the last price sheet was mailed. Results showed that farmers who received experimental price reporting services possessed a significantly higher level of knowledge about the base price received for milk in the

previous pay period. They also knew alternative milk prices more often than the control area sellers. However, even though farmers who received experimental reporting service information were better informed there was no immediate mass response to changes in milk prices during the period of study. Few changes in daily milk marketing operations were reported by either wholesalers or farmers who received the price reporting service or those who did not. Furthermore, there was no appreciable change in the range of prices paid for milk during the seven months of the experimental period. The reporting service appeared to do little to increase competition among purchasing firms.

It should be noted, however, that within the experimental area the firm paying the lowest price during the first week of the experiment received several threats of patrons leaving because they had become aware this company was paying a lower price. However, with a slight upward price adjustment this firm maintained its customers; and by the end of the study it stated the information given to its patrons had had no effect on its pricing policy.

B. Wool, Influence of Classification and Market Information Services on Prices Paid to Producers

In cooperation with the New Mexico Agricultural Experiment Station, data were assembled concerning wool prices paid to producers and the laboratory determination of quality for some 190 lots. Furthermore, information was obtained for 176 lots of wool at warehouses in North Central and Western States in cooperation with the Livestock Division of the Agricultural Marketing Service. In addition, data were assembled providing prices to growers and subjective evaluations of a large volume of wool sold through warehouses in nine Western States from April to August 1962 and generally to October 1963. These data will be used to determine means of improving the marketing information services for wool.

Preliminary results show that the present wool market news reports, published in Boston, may not accurately be reflecting wool prices in the producing area. Utilization of the Agricultural Marketing Service's livestock reporters to obtain local sales information for inclusion in the Boston report appears desirable.

C. Leather and Competitive Substitutes, Long-Term Trends in their Supply and Demand

Present trends indicate that 60 percent of the domestic shoe production may use nonleather materials by 1970. With such a decrease in domestic demand for leather, half of our total hide supply, estimated at 33 to 35 million hides, may move into foreign markets by 1970.

D. Cotton, Central Market Quotation and Factors Affecting their Adequacy

Analyses of cotton sold in 15 central markets showed that prices quoted in many markets during the 1959-60 and 1960-61 seasons frequently were poor

indicators of the market value of many qualities of cotton. Prices quoted for the higher qualities averaged lower than those paid during most of the season; prices quoted for the lower qualities were below those paid during long periods of the season but were above those paid during equally long periods. Average premiums and discounts quoted by designated methods during the season and for the entire season were found to deviate sufficiently from those paid for some qualities, to continually affect the usefulness to the Commodity Credit Corporation in its price support and sales programs, and for determination as tenderable differences in futures trading.

E. New Grain Market News Part of Study of Market Information Services in Missouri

In cooperation with the University of Missouri a review was made of all marketing information services provided by State and Federal governments in the State. These services were identified as to type and kind; and the publication to be issued indicates sources of each data series and the kinds of information which each series presents so farmers will be able to quickly ascertain what the local price, quality, and product movement situations are for leading Missouri commodities.

The USDA cooperated with the Missouri Department of Agriculture in establishing an experimental grain market news service. This service reported current transactions on interior grain markets.

A mail survey of Missouri farmers and marketing firms receiving this report showed this service was providing local price and grain movement information not elsewhere available. Because of the favorable reception of this reporting service, Missouri Department of Agriculture will continue this service.

F. Feasibility for Establishment of Vegetable Processing Establishments in the Southeast

Vegetable processing is a small industry in the Southeast. Little is known concerning the economic conditions under which vegetable processing plants may reasonably expect to prosper in the South. Nevertheless, vegetable growers, processors, public officials, and others have expressed a strong interest in determining whether processing plants can be economically feasible as market outlets for large quantities of vegetables grown in the Southeast. A considerable part of this interest stems from a strong desire to increase industrial development in the region. A survey of the vegetable processing industry in seven Southeastern States shows its major problems to be an inadequate supply of high quality vegetables for processing, price competition from other processors in selling the finished product, and financing the inventories of processed vegetables until they are sold. A case study of the feasibility of locating both a freezing plant and a canning plant in the Jackson County area of Florida yielded the following summary data:

<u>Item</u>	<u>Freezing</u>	<u>Canning</u>
Annual volume required	9.5 million pounds	585,000 cases
Initial capital investment required:		
Buildings and equipment	\$ 860,000	\$ 350,000
Annual operating capital	\$1,200,000	\$1,270,000
Net profit after taxes	\$ 109,722	\$ 77,301
Net profit as a percentage of fixed investment	12.76	22.08
Net profit as a percentage of gross sales	7.73	5.43

In addition, a study of market entry for a new processing plant into an established, adequately supplied market suggests a need for careful planning to combat the sharp competition. With good management, market introduction costs were estimated to be about 10 cents per case.

G. First Phase of Long-Term Outlook for Marketing Western Agricultural Products Relates to Fruits and Vegetables

Outlook for the marketing of fruits and vegetables for the 11 Western States was projected for the period 1975. These projections show a continued growth in the volume of these products and indicate that this western region should supply an increasing share of the total. The forecast is based on an expected increase of 31 percent in total U.S. population and some increase in per capita consumption per year. The West now supplies about 65 percent of noncitrus fruit, 45 percent of vegetables, and 28 percent of citrus fruits. Increases in the proportion of total supply of noncitrus fruits and vegetables, with a small decrease in the proportionate citrus fruits supplied by the West, appear in prospect. These changes can be viewed in terms of the total U.S. consumption increase projected for the period of approximately 33 percent above that of 1960.

The greatest growth including vegetable sales appears to be in processed products. The greatest growth in food and vegetable processing between now and 1975 is likely to be in freezing, combined freezing and dehydration, and various improved methods of dehydration. In these areas processing has grown rapidly and is likely to continue to grow for the next several years, though possibly at a slower rate.

H. Long-Term Outlook for Industries Assembling and Processing Products of Agriculture in the Pacific Northwest

This research, by five-year periods between 1965 and 1980, will project the production and employment in establishments assembling and manufacturing products of agriculture. The geographical area covered will include the States of Washington, Oregon, Idaho, and western Montana. Projections for the statistical base period (1965) are near completion.

During the coming year extensive progress is anticipated in completing the series of five-year projections.

I. Situation and Outlook Report

1. Marketing. Recent trends in retail costs, farm values, and farm-retail spreads for farm foods and costs incurred by marketing firms were described in the Marketing and Transportation Situation. The marketing bill continued to increase as it has every year since 1950. Consumers spent \$64.3 billion for food products in 1962; and farmers received a record \$21.4 billion for the equivalent of farm products, 2 percent more than in the previous year. The labor cost component of the marketing bill climbed 4 percent, from 1961 to 1962, reflecting an increase in unit labor cost as well as in the volume of products handled. Corporate profits before taxes were up 5 percent, but after taxes profits totaled the same as in 1961. Other costs and noncorporate profits (as a group) increased about 2 percent.

Consumer expenditures for food in the first quarter of 1963 averaged \$398 per person (seasonally adjusted annually), about the same as in the preceding quarter, but 2 percent higher than in the first quarter of 1962. Per capita expenditures increased by about the same percentage as per capita disposable income. Over a longer period, however, expenditures for food have not risen as much as income; so the percentage spent for food declined to 19.1 in 1962, from 19.5 percent in 1961 and 23.4 percent in 1952. The percentage spent for clothing and shoes declined slightly in 1962 from 1952 while the percentage spent for tobacco remained about constant.

2. Transportation. Additional special studies reported during the year showed that in 1960 the 1,514 exempt for-hire truckers included in the study moved 9.2 million tons of exempt commodities and traveled 278 million miles. Seventy-five percent of the reporting firms have been in business five years or more, and 8 percent reported they had been in business 30 years or more. Although many of these truckers operated only one or two trucks, 50 of the carriers operated a third of the tractors reported in the survey. Grain and livestock made up about one-half of the tonnage hauled. Milk, cream, vegetables and fruits, and berries accounted for an additional 35 percent of the total. Seventy percent of all miles traveled were laden miles. More than a third of the carriers hauled interstate exclusively. Thirty-five percent of principal movements of exempt commodities originated outside home regions, and 49 percent of principal deliveries were made for states outside home regions.

Analysis of 48 feeder-financing and contract programs showed 42 percent were unprofitable. The informal programs were more frequently profitable than formal programs. The unprofitable experience with financing and contract programs in the Midwest could slow the growth of integration and livestock feeding in that area.

Pilot Food Stamp programs were expanded to include 39 additional areas throughout the Nation, starting in August 1962. Between 135,000 and 140,000 persons received coupons each month during the initial year of operation. Food sales per participant rose by at least \$7 per month above sales prior to the initiation of the program. The overall sales gain approximated 8 percent. Participation increased the number of persons whose dietary pattern equaled or exceeded the nutritional allowances recommended by the National Research Council.

3. Annual Agricultural Outlook Charts. Charts reporting marketing costs and projections are annually prepared for the Outlook Chartbook and special reports issued by the Department. These charts picture changes in costs of transportation, labor, freight rates, prices of producers' durable equipment, and of intermediate goods and services, as well as such relationships as the rate of fruit and vegetable or wheat shipments to rail rates.

J. Rural Development

1. Role of Farm Purchases in Supporting Jobs in Farm Supply and Equipment Industries. Time series data show farm purchases of supplies and equipment support approximately 1.1 million jobs annually in farm supply industries.

2. Role of Public Programs, Directly Related to Rural Area Development in Supporting Jobs. Like private investment, to create new jobs public programs cannot be "one-shot efforts." The creation and maintenance of investment expenditures are prerequisite for lasting job creation. A time series evaluation of selected Government programs from Area Redevelopment Administration, Small Business Administration, Federal Aviation Agency, Rural Electrification Administration, Tennessee Valley Authority, Farmers Home Administration, Soil Conservation Service, Agricultural Stabilization and Conservation Service, and portions of the Department of Defense, indicates that approximately 5½ million jobs (private and public) have been created and are being maintained as an ultimate effect of these programs.

3. Review of Specific Area Redevelopment Administration Proposals. Between January 1, 1963, and September 1963, 14 specific ARA proposals were reviewed. These proposals included both applications for loans and suggested technical assistance studies. In total, over half of the projects proposed received qualified approval and involved loans totaling more than \$2.2 million.

PUBLICATIONS

Wool

O'Dell, Charles A. June 1963. USDA research may provide broader coverage of Nation's wool trade. Agricultural Marketing.

Leather

Thompson, John W. April 1963. Some economic considerations for the hide and leather industry. Speech presented before National Hide Association Training School.

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Williams, Floyd W. July 1963. A case study in development of community resources. Speech given to the Florida Association for Vocational Agricultural Teachers at Daytona Beach, Florida.

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Marketing and Transportation Situation. Quarterly. ERS.

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Developments in marketing spreads for agricultural products in 1962. August 1963. Reprinted from Hearings Before the Subcommittee of the Committee on Appropriations, United States House of Representatives, Eighty-eighth Congress, First Session. ERS-14.

Rural Area Development

Hammond, Leigh H. May 1963. The feasibility of expanding the sweet-potato canning industry in the South. Mktg. Res. Rpt. 603.

Spielmann, Heinz. October 1962. Fruit and vegetable marketing problems associated with rural development in Montana. Montana Agricultural Experiment Station Bulletin No. 573.

Line Project Check List -- Reporting Year October 1, 1962, through September 30, 1963

Work and line project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of: progress (Yes-No)	Area and subheading
ME 1	Market structure and costs in the marketing of farm products			
ME 1-1 (Rev.)	Measurement of components of farm-to-retail price spreads for selected food commodities on a continuing basis <u>1/</u>	Washington, D.C.	No	
ME 1-2	Cost and efficiency in wholesaling frozen foods <u>1/</u>	Washington, D.C.	No	
ME 1-5	Extent and effects of labor practices and provisions: on the costs, adequacy, and structure of agricultural marketing	Washington, D.C.	Yes	6-K-3
ME 1-6	Role of agricultural marketing and other industrial firms in supplying additional employment and higher incomes for residents of low-income farm areas	Washington, D.C. Baton Rouge, La.	Yes	8-J-2&3
ME 1-7 (Rev.)	Patterns of growth and change in the structure of agricultural marketing and supply industries and their probable economic consequences	Washington, D.C. Madison, Wis.	Yes	8-J-1
ME 1-10	Economic importance of taxes in the marketing of agricultural commodities <u>1/</u>	Washington, D.C.	Yes	7-P-3
ME 1-11	Extent and effects of advertising and promotion on the costs, adequacy, and structure of agricultural marketing	Washington, D.C.	Yes	3-H-11
ME 1-12 (Rev.)	Marketing situation and outlook reports	Washington, D.C.	Yes	8-I
ME 1-13 (Rev.)	Farm-to-retail price spreads, the marketing bill and other statistics on entire marketing process	Washington, D.C.	Yes	6-K-1
ME 1-14	Appraisal of uses made of and needs for marketing information	Washington, D.C. Manhattan, Kans. Columbia, Mo.	Yes	8-A&E
ME 1-15 (Rev.)	Providing statistical and economic information relating to the marketing of agricultural products	Washington, D.C.	No	
ME 1-16	Measurement of input-output relationships in farm food marketing	Washington, D.C.	Yes	6-K-2
ME 1-18	Long term outlook for marketing western agricultural products	Berkeley, Calif.	Yes	8-G
ME 1-19	Pricing practices of food firms of selected products	Washington, D.C.	Yes	7-P-2
ME 1-20	Profits of agricultural marketing firms and their relationship to prices, market structure, and performance <u>1/</u>	Washington, D.C.	Yes	7-P-3
ME 1-21	Effects of selected Federal regulatory and service activities on the market structure, conduct, and performance of agricultural marketing and processing industries	Washington, D.C. Lafayette, Ind.	Yes	7-J-2
ME 1-22	Economic impact of innovations	Washington, D.C.	Yes	2-3-b
ME 1-23	Long-term outlook for processing and assembling agricultural products in the Pacific Northwest <u>2/</u>	Corvallis, Ore.	Yes	8-H
ME 2	Economics of marketing farm animals and animal products			
ME 2-1	Evaluation of present and alternative methods of establishing quotations and reporting prices for eggs	Washington, D.C.	Yes	7-B-1
ME 2-3	Quarterly measurement and analysis of costs, margins, and efficiency for 80 selected fluid milk processing and distributing plants <u>1/</u>	Washington, D.C. Memphis, Tenn.	Yes	6-A-1

- Continued

1/ Discontinued during reporting year.

2/ Initiated during reporting year.

Line Project Check List -- Reporting Year October 1, 1962, through September 30, 1963--Continued

Work and line project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress (Yes-No)	Area and subheading
ME 2-4 (Rev.)	Costs and margins of marketing livestock and meats and meat products	Washington, D.C.	Yes	6-C-1
ME 2-7 (Rev.)	Economic requirements for development of a commercial egg industry in the South	Washington, D.C. Athens, Ga.	Yes	6-B-1
ME 2-8 (Rev.)	Characteristics and impact of retail price wars in city milk markets	Washington, D.C.	Yes	7-A-1
ME 2-9	Impact of seasonality of milk production on labor efficiency in plants manufacturing dairy products <u>1/</u>	Lafayette, Ind.	No	
ME 2-10	Commercial hatchery costs, operations, and trends	Washington, D.C.	Yes	6-B-2
ME 2-12	Costs and economies of scale in assembling and processing turkeys	Washington, D.C.	Yes	6-B-3
ME 2-13	Improving the efficiency of poultry marketing in New England	Washington, D.C. Durham, N.H.	Yes	6-B-4
ME 2-14	Marketing Economics Division cooperation on southern regional poultry marketing research (SM-26) "The marketing structure for broilers in the South and an analysis of the impact of a national marketing order upon its economic organization and efficiency"	Washington, D.C. Knoxville, Tenn.	No	
ME 2-15	Marketing Economics Division cooperation in north central regional poultry marketing research (NCM-31) "Coordinated egg production-marketing programs and new marketing technology"	Washington, D.C.	No	
ME 2-17	Factors affecting variability of butterfat tests from selected sampling routines for producers in selected Federal order markets for a 12-month period <u>1/</u>	Washington, D.C.	Yes	5-A-1
ME 2-20 (Rev.)	Economic effects and distribution of meats by U.S. grades <u>1/</u>	Washington, D.C.	Yes	5-C-1
ME 2-21	An appraisal of pooling in relation to changing supply and demand conditions in fluid milk markets	Washington, D.C.	No	
ME 2-26	Marketing Economics Division cooperation in north-eastern regional poultry marketing research (NEM-21) "Effect of marketing changes upon marketing costs and upon demand and consumption of poultry meat"	Washington, D.C.	No	
ME 2-29	Establishing guides for efficient organization of the dairy industry under changing conditions in the South	Experiment, Ga.	Yes	6-A-2
ME 2-30	The effects of live animal and carcass shrinkage on pricing cattle and hogs	Washington, D.C. Colorado	No	
ME 2-31	An analysis of livestock and meat movements in the southern region	Washington, D.C. Raleigh, N.C.	Yes	6-C-3
ME 2-32	Economic analysis of competitive relationships between livestock markets and marketing channels in the West (WM-37, WM-39)	Denver, Colo., 11 Western States, and Texas	No	
ME 2-33	Research for improved live hog and carcass pricing and grading	Washington, D.C.	Yes	5-D-1
ME 2-35	Factors affecting efficiency of marketing livestock and meats in the Northeast (NEM-7)	Washington, D.C.	No	
ME 2-36	Relation of quality factors in butter to price and brand <u>1/</u>	Washington, D.C.	No	
ME 2-37	The effect of specialized dairy product outlets on the dairy industry in selected markets of the western region <u>1/</u>	Berkeley, Calif.	Yes	7-A-2

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1/ Discontinued during reporting year.

Line Project Check List -- Reporting Year October 1, 1962, through September 30, 1963--Continued

Work and line project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of: progress (Yes-No)	Area and subheading
ME 2-38	An economic analysis of methods of determining protein and solids-not-fat content as a basis for purchasing milk	Davis, Calif. Washington, D.C.	Yes	5-A-2
ME 2-39	An evaluation of the competitive position and potential of the Texas-Oklahoma area in the marketing and distribution of livestock and meat	Texas and Oklahoma	Yes	7-C-3
ME 2-40	Estimation of grade composition of market hogs <u>1/</u>	Washington, D.C.	Yes	5-D-2
ME 2-41	Adjustments in livestock marketing in the north central region to changing patterns of production and consumption (NCM-25)	Ames, Iowa St. Paul, Minn.	Yes	7-C-4
ME 2-42	Flexibility in dairy products manufacturing plants	Washington, D.C.	No	
ME 2-43	Procurement policies and practices of large-volume distributors of eggs	Washington, D.C. University Park, Pa. Columbus, Ohio	Yes	7-B-2
ME 2-45	A study of the capacity and flexibility of facilities in milk manufacturing plants	St. Paul, Minn.	Yes	6-A-3
ME 2-46	Economics of long distance movement of bulk milk	Washington, D.C.	No	
ME 2-47	Marketing margins for fluid milk	Washington, D.C.	No	
ME 2-48	Changing market structure and organization of mid-west dairy industry	Washington, D.C. Urbana, Ill.	Yes	7-A-3
ME 2-49	Procedures, marketing costs, and effects on marketing of maintenance of egg quality from laying house to consumer	Washington, D.C.	Yes	5-B-1
ME 2-50	Pricing and marketing milk used for other than fluid purposes in fluid milk markets	Washington, D.C. Columbia, Mo.	Yes	6-A-4
ME 2-51	Bibliography of selected subjects in marketing of livestock, meat, and meat products	Washington, D.C.	No	
ME 2-52	Market structure and pricing in the livestock industry	Washington, D.C.	Yes	7-C-5
ME 2-53	Information systems for managerial decisionmaking in fluid milk plants	Washington, D.C. Lafayette, Ind.	No	
ME 2-54	Cost efficiency studies in marketing livestock meats and meat products <u>2/</u>	Washington, D.C.	Yes	6-C-2
ME 2-55	Determining costs, margins and trends in the poultry and egg industries <u>2/</u>	Washington, D.C.	Yes	6-B-5 7-B-4&5
ME 2-56	Quarterly measurement and analysis of costs, margins and efficiency for 70 selected fluid milk processing and distributing plants <u>2/</u>	Washington, D.C. Memphis, Tenn.	Yes	6-A-1
ME 3	Economics of marketing farm crops			
ME 3-1	Charges and practices in marketing cotton	Washington, D.C.	Yes	6-D-1
ME 3-3	Marketing margins and costs for fibers and textiles	Washington, D.C.	Yes	6-D-2
ME 3-4	Margins and costs for tobacco leaf and tobacco products	Washington, D.C.	Yes	6-J-3
ME 3-6	Economic impacts of St. Lawrence Seaway on the marketing of agricultural products <u>1/</u>	Washington, D.C.	Yes	4-G-1
ME 3-8	Economic factors in organization and location of western fruit and vegetable freezing plants	Berkeley, Calif. Washington, D.C.	Yes	7-I-1
ME 3-10	Analyzing price spreads, margins, and costs for grain and feed products	Washington, D.C.	Yes	6-F-1
ME 3-13	Economic evaluation of cotton quality	Clemson, S.C.	Yes	5-E-1
(Rev.)		Washington, D.C. Stoneville, Miss. Tucson, Ariz.		

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1/ Discontinued during reporting year.

2/ Initiated during reporting year.

Line Project Check List -- Reporting Year October 1, 1962, through September 30, 1963--Continued

Work and line project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of: progress (Yes-No)	Area and subheading
ME 3-14	Competition in marketing of grapefruit--a phase of southern regional citrus project "The economic efficiency of marketing Florida, Puerto Rico, and Texas citrus fruit" 1/	Gainesville, Fla.	No	
ME 3-15	Costs and efficiency in the operation of feed mixing plants	Washington, D.C.	Yes	6-G-1
ME 3-19	Changes in quality and value of cotton bales and samples during storage	Tucson, Ariz.	Yes	5-E-2
ME 3-20	Costs of handling, packing and distributing pears 1/	Stoneville, Miss.		
ME 3-21	Analysis of marketing practices, costs, and margins of hides, skins, and pelts as related to uses of leather and leather products	Berkeley, Calif.	No	
ME 3-22	Costs and efficiency of looseleaf tobacco auctions	Washington, D.C.	Yes	7-K-1
ME 3-23	Industry structure and the costs of storing sorghum grain in commercial elevators	Lexington, Ky.	Yes	6-J-2
ME 3-24	The organization, costs, and efficiency of tobacco redrying plants	College Station, Texas	Yes	7-G-1
ME 3-25	Costs and efficiencies of commercial seed processing plants 1/	Washington, D.C.	No	
ME 3-30	Changes in structure of wholesale fruit and vegetable markets	Corvallis, Ore.	Yes	6-G-2
ME 3-33	Influence of classification and market information services on wool prices to producers	Washington, D.C.	Yes	7-I-2
ME 3-35	Structure and performance of the rice milling industry	Washington, D.C.	Yes	8-B
ME 3-37	Organization and practices in the processing market for potatoes and the impact on the structure of the fresh potato market 1/	Washington, D.C.	Yes	6-F-2
ME 3-38	An economic evaluation of opportunities for vegetable processing in the South	Moscow, Idaho	Yes	7-M-1
ME 3-39	The economics of marketing hay and feed grains in the West 1/	Raleigh, N.C.	No	
ME 3-40	Impact of vine-ripened (pink) tomato production on Florida tomato market	Washington, D.C.	No	
ME 3-41	Marketing Economics Division cooperation on regional research project WM-41 on influence of recent technological developments on the marketing and market acceptance of western cotton 1/	Gainesville, Fla.	Yes	7-N-1
ME 3-42	Central market quotations for cotton and factors affecting their adequacy	Tucson, Ariz.	No	
ME 3-45	Feasibility of grading, sorting, scouring, and baling wool in producing areas	Washington, D.C.	Yes	8-D
ME 3-50	Market structure and practices of the pecan industry	College Station, Texas, Columbus, Ohio, and Washington, D.C.	Yes	6-E-1
ME 3-51	Analysis of market news reporting and price spreads for formula feed in the Georgia-Alabama broiler area 1/	Washington, D.C.	Yes	7-L-1
ME 3-53	The impact of technological changes on the structure and organization of the California deciduous fruit industry--a phase of WM-43	Athens, Ga.	No	
ME 3-54	An economic evaluation of processing as a market outlet for vegetables in the Southeast	Berkeley, Calif.	Yes	7-K-2
ME 3-55	Cotton ginning efficiency and cost	Washington, D.C.		
		Experiment, Ga.	Yes	8-F
		Stoneville, Miss.	Yes	6-D-3
		Tucson, Ariz.		
		Washington, D.C.		

1/ Discontinued during reporting year.

Line Project Check List -- Reporting Year October 1, 1962, through September 30, 1963--Continued

Work and line project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of: progress (Yes-No)	Area and subheading
ME 3-57	Long-term trends in the demand and supply of sugar and competitive sweeteners and their effect on processing and marketing costs and services	Washington, D.C.	Yes	7-H-2
ME 3-58	An economic evaluation of alfalfa hay grading	Washington, D.C. Reno, Nev.	Yes	5-G-1
ME 3-59	"Eastern" beet sugar marketing problems	Washington, D.C. East Lansing, Mich.	Yes	7-H-1
ME 3-60	Organization, operation, and efficiency of wool pools	Washington, D.C.	Yes	6-E-1
ME 3-61	Pricing cotton in relation to fiber properties	Washington, D.C.	Yes	7-D-1
ME 3-62	Costs and margins in marketing sugar as affected by changing practices	Washington, D.C.	No	
ME 3-63	Costs and efficiency of grain storage and handling in the spring wheat area	Bozeman, Mont.	Yes	6-F-3
ME 3-64	Cost of curing hides <u>1/</u>	Columbus, Ohio	Yes	6-K-4
ME 3-65	Impacts of grain banks on feed milling and farming	Lafayette, Ind. Washington, D.C.	Yes	6-G-3
ME 3-66	Costs, prices, and competition in the red tart cherry industry	East Lansing, Mich.	Yes	7-K-1
ME 3-67	Structure and performance of the lower Rio Grande Valley fruit and vegetable market	Washington, D.C.	Yes	7-I-3
ME 3-68	Costs and efficiencies in bread distribution	Berkeley, Calif.	Yes	6-F-1
ME 3-69	Costs and practices of peanut shellers	Washington, D.C.	Yes	6-I-3
ME 3-70	Labor utilization at cottonseed oil mills	Washington, D.C.	Yes	6-D-4
ME 3-71	Marketing margins and costs for peanuts in peanut butter <u>1/</u>	Washington, D.C.	Yes	6-I-2
ME 3-72	Changes in the structure and performance of the California fruit and vegetable industry	Davis, Calif.	Yes	7-I-4
ME 3-73	Feasibility of cotton fabrics as bagging for American cotton	Washington, D.C.	No	
ME 3-74	Feasibility of marketing radiation pasteurized fresh strawberries, peaches, citrus, grapes, and tomatoes	Washington, D.C.	Yes	5-H-1
ME 3-75	Economic analysis of structure and performance of the Red River Valley potato market	St. Paul, Minn.	Yes	7-M-1
ME 3-76	Competitive relationships in marketing citrus products	Gainesville, Fla. Grand Rapids, Mich.	Yes	7-J-1
ME 3-77	Study Canadian tobacco auctions	Guelph, Ontario	Yes	7-E-1
ME 3-78	Cost of operating grain elevators <u>2/</u>	Washington, D.C.	Yes	6-F-5
ME 3-79	Cost and efficiency of warehousing and related services for cotton <u>2/</u>	Washington, D.C.	Yes	6-D-5
ME 3-80	Sheller margins and market patterns for peanuts	Washington, D.C.	Yes	6-I-4
ME 3-81	Economic evaluation of the commercial utilization pattern for peanuts at the sheller level	Raleigh, N.C.	Yes	6-I-5
ME 3-82	Tobacco quality and the pricing system	Washington, D.C.	Yes	5-F-1
ME 3-83	Long-term trends in the supply and demand for leather and competitive substitutes <u>2/</u>	Washington, D.C.	Yes	8-C
ME 3-84	Marketing margins for fats and oils in selected consumer products	Washington, D.C.	Yes	6-I-1
ME 3-85	Changing structure and performance of the north-eastern markets for grain	College Park, Md.	Yes	7-F-1
ME 3-86	An analysis of intraseasonal variation in apple prices <u>2/</u>	Washington, D.C. East Lansing, Mich.	Yes	7-K-3
ME 3-87	Changing structure and performance of markets for grain in the north central region <u>1/ 2/</u>	Washington, D.C.	No	

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1/ Discontinued during reporting year.

2/ Initiated during reporting year.

Line Project Check List -- Reporting Year October 1, 1962, through September 30, 1963--Continued

Work and line project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress (Yes-No)	Area and subheading
ME 3-88	An economic analysis of market orders for fruits, vegetables, and potatoes <u>2/</u>	Washington, D.C.	Yes	7-I-5
ME 3-89	Economic behavior and performance of markets for major oilseed products <u>1/ 2/</u>	Washington, D.C.	No	
ME 3-90	Prices and margins in marketing fruits and vegetables <u>2/</u>	Washington, D.C.	Yes	6-H-2
ME 3-91	Marketing industrial molasses <u>2/</u>	Washington, D.C.	Yes	7-H-3
ME 3-92	Economics of marketing sugar <u>2/</u>	Washington, D.C.	Yes	7-H-2
ME 3-93	Costs of packing and storage of Michigan apples <u>2/</u>	East Lansing, Mich.	Yes	6-H-1
ME 4	Economics of new, expanded, and alternative uses of farm products			
ME 4-1	Market potentials for dialdehyde starch and/or its derivatives in industrial uses and as starting raw materials in chemical industry products <u>1/</u>	Washington, D.C.	No	
ME 4-2 (Rev.)	Market potential for super-concentrated (7-fold) fruit juices	Washington, D.C.	Yes	2-H-1
ME 4-3	Market potentials for improved egg products in remanufacturing uses <u>1/</u>	Cambridge, Mass. Albany, Calif. Washington, D.C.	Yes	2-B
ME 4-4	An economic appraisal of the effects of new product technology in the form of convenience foods on food prices at various levels of distribution	Washington, D.C.	Yes	2-I-3
ME 4-6	Market potential investigations for products from new crops for industrial, feed, food, or pharmaceutical use	Washington, D.C.	Yes	2-I-1
ME 4-8	Economic effects of nonscourable foreign materials in domestic wool on present and potential markets	Washington, D.C. Boston & S. Barre, Mass. Woonsocket, R.I. Albany, Calif.	Yes	2-C-1
ME 4-9	Study of the market potential for hides and skins in the leather industry <u>1/</u>	Washington, D.C.	Yes	2-D
ME 4-10	Market potentials for fats and oils and fatty acids in selected industrial use markets	Washington, D.C. Chicago, Ill.	Yes	2-F-1
ME 4-12	Market potentials for materials of agricultural origin in adhesives	Washington, D.C. Newark, N.J.	Yes	2-G-1
ME 4-13	Market potentials for frozen bakery products	Albany, Calif. Washington, D.C.	Yes	2-G-2
ME 4-14	Commercial possibilities of dehydrofrozen apple slices in institutional markets <u>1/</u>	Washington, D.C.	Yes	2-H-1
ME 4-15	Market potential for bulgur, unseasoned and pilaf	Washington, D.C.	No	
ME 4-16	Market potentials for unextracted soybean meal in poultry feeds	Washington, D.C.	Yes	2-F-3
ME 4-17	Market potentials for Hawaii farm products	Honolulu, Hawaii	Yes	2-I-2
ME 4-18	Market potentials for hides and skins in alternative markets to leather	Washington, D.C.	Yes	2-D
ME 4-19	Market potential for modified edible fats and oils	Chicago, Ill. New Orleans, La. Washington, D.C.	Yes	2-F-2
ME 4-20	Market potentials for interfacial polymerized wool in textiles	Washington, D.C.	Yes	2-C-2
ME 4-21	Market potential for sweetpotato flakes in selected markets	Cleveland, Ohio New Orleans, La. Washington, D.C.	Yes	2-H-2

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1/ Discontinued during reporting year.

2/ Initiated during reporting year.

Line Project Check List -- Reporting Year October 1, 1962, through September 30, 1963--Continued

Work and line project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress (Yes-No)	Area and subheading
ME 4-22	Market potentials for cereal grain starch products in new industrial uses	Washington, D.C.	Yes	2-G-4
ME 4-23	Market potential for low fat fluid milk	Washington, D.C.	Yes	2-A
ME 4-24	Market potentials for water-soluble gums and mucilages other than starch	Washington, D.C.	No	
ME 4-25	Market analysis of the processing and marketing of maple sirup and other maple products	Pennsylvania State University	No	
ME 4-26	An appraisal of the distribution practices and patterns of the domestic and territorial rice markets	Washington, D.C.	Yes	2-G-3
ME 4-27	Economic potential for <u>Crambe abyssinica</u> as a new commercial farm crop <u>2/</u>	Washington, D.C.	Yes	2-I-1
ME 5	Evaluation of the effects of merchandising methods and practices on sales of and consumer demand for farna products			
ME 5-2	Evaluation of the use of in-store promotional materials provided by agricultural-producer groups <u>1/</u>	Washington, D.C. New York	Yes	3-I-1
ME 5-3	Development of a manual of basic advertising and promotional procedures for producer-promotional groups <u>1/</u>	Washington, D.C. Illinois	Yes	3-D-10
ME 5-4	Evaluation of the sales effectiveness of a special promotional campaign for frozen concentrated orange juice	Washington, D.C. Florida New York	Yes	3-E-1
ME 5-5	A survey and evaluation of merchandising practices for dairy products in restaurants <u>1/</u>	Washington, D.C.	No	
ME 5-6	Evaluation of effects of major innovations in food store layout and product location on selling efficiencies for agricultural products <u>1/</u>	Washington, D.C.	Yes	3-I-3
ME 5-7	Evaluation of the effect of various promotional themes and techniques on lamb sales <u>1/</u>	Washington, D.C.	No	
ME 5-8	Household purchases and retail availability of selected fruits and juices, 1950-60	Washington, D.C. New York	Yes	3-E-2
ME 5-9	Increased produce sales through improved merchandising in retail food stores	Washington, D.C.	Yes	3-H-1
ME 5-10	Evaluation of the long-term sales effects of advertising and promotion for Florida oranges and grapefruit	Washington, D.C.	No	
ME 5-11	Evaluation of sales effect of alternative space allocation plans for perishable departments in retail food stores <u>1/</u>	Washington, D.C.	No	
ME 5-12	Evaluation of the effects of various promotional themes and techniques on sales of winter pears	Washington, D.C.	Yes	3-F-3
ME 5-13	Evaluation of the effect of color on sales of red varieties of apples <u>1/</u>	Washington, D.C. Atlanta, Ga.	Yes	3-F-1
ME 5-14	Economics of inventory control and space management in warehousing agricultural products	Washington, D.C.	Yes	3-I-5
ME 5-15	Improved methods of inventory control and space allocation for produce and frozen food departments of retail food stores	Washington, D.C. Massachusetts	Yes	3-I-4
ME 5-16	Development of standards of performance and trend measurements of operating efficiency in food distribution <u>1/</u>	Washington, D.C.	No	

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1/ Discontinued during reporting year.

2/ Initiated during reporting year.

Line Project Check List -- Reporting Year October 1, 1962, through September 30, 1963--Continued

Work and line project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress (Yes-No)	Area and subheading
ME 5-17	Evaluation of the sales effectiveness of selected advertising and promotion techniques for broilers	Washington, D.C.	Yes	3-B-1
ME 5-18	The impact of pricing policies, procurement, and merchandising practices of discount houses on conventional food distribution	Ohio Washington, D.C. New York	Yes	3-I-6
ME 5-19	Measurement of food stocks and nonconcentrated fluids in warehouses at the wholesale level of distribution and revising the retail food stock survey	Washington, D.C.	Yes	3-I-2
ME 5-20	Appraisal of expenditures by agricultural producers for advertising, promotion, and public relations activities	Washington, D.C.	Yes	3-I-9
ME 5-21	Effect of varying levels of promotional investment on the consumption of milk and milk products and the relationship of returns to promotional investment	Washington, D.C.	Yes	3-A-1
ME 5-22	Market analysis and development of desert citrus industry of Arizona and California	Washington, D.C. Arizona	Yes	3-E-4
ME 5-23	Surveys of consumer purchases of fresh and processed fruit products in relation to consumer characteristics, geographic regions, and other market factors	Washington, D.C. New York	Yes	3-E-2
ME 5-24	Economics of pricing, merchandising, and labor utilization practices in retailing meat products <u>2/</u>	Washington, D.C. Ohio	Yes	3-C-1
ME 5-25	Measurement of food stocks and nonconcentrated fluids in inventory in away-from-home eating establishments <u>2/</u>	Washington, D.C.	Yes	3-I-2
ME 5-26	Evaluation of weekly features on the retail sales of selected fresh commodities, on sales of non-featured products and on store volume <u>2/</u>	Washington, D.C.	Yes	3-I-7
ME 5-27	Evaluation of the effect of various promotional themes and techniques on sales of fresh peaches <u>2/</u>	Washington, D.C. State of Washington	Yes	3-F-4
ME 5-28	Effect of variation in solids (sugars), level of fresh oranges on retail sales <u>2/</u>	Washington, D.C.	Yes	3-E-3
ME 5-29	Appraisal of the Amsterdam Trade Fair exhibition and symposium on sales of American farm products <u>2/</u>	Washington, D.C.	Yes	3-I-8
ME 5-30	Appraisal of current marketing practices in the floral industry and evaluations of alternative promotions, merchandising, and management practices in improving sales efficiency and expanding demand for floral products	Washington, D.C.	Yes	3-G-1
ME 6	Distribution programs research			
ME 6-2	Evaluation of methods of distribution of federally donated commodities within states	Washington, D.C.	Yes	1-A-3
ME 6-4	Surveys and analyses of new food distribution programs for low-income households	Washington, D.C.	Yes	1-A-1
ME 6-5	Surveys and analyses of effect of food stamp operations on sales in retail food outlets	Washington, D.C.	Yes	1-A-2
ME 6-6	Market for food in public and private schools	Washington, D.C.	Yes	1-B-1
ME 6-7	Study of consumption patterns of moderately high income families	Minnesota	Yes	1-D-2
ME 6-8	Surveys and analyses of commodity distribution programs for low-income households <u>2/</u>	Washington, D.C.	Yes	1-A-1

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1/ Discontinued during reporting year.

2/ Initiated during reporting year.

Line Project Check List -- Reporting Year October 1, 1962, through September 30, 1963--Continued

Work and line project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress (Yes-No)	Area and subheading
ME 6-9	Central food preparation and distribution in urban school systems <u>2/</u>	Washington, D.C.	Yes	1-B-2
ME 6-10	Evaluation of the institutional market for food <u>2/</u>	Washington, D.C.	Yes	1-D-1
ME 7	Transportation costs and services and their economic effect on agriculture			
ME 7-1	Economic research and consultation to meet current requests for information	Washington, D.C.	No	
ME 7-2	Development of statistics for the transportation bill and rail freight rate indexes	Washington, D.C.	Yes	4-D-1
ME 7-3	Transportation and Facilities Research Division cooperation in SM-11 project (rev.), transportation of grain and grain products in the South	Washington, D.C.	Yes	4-A-3
ME 7-4 (Rev.)	Determination and analysis of costs of motor carriers engaged in the transportation of farm products	Washington, D.C.	Yes	4-E-1
ME 7-5	Determination and appraisal of the nature and scope of operations of exempt for-hire carriers and truck brokers in the movement of agricultural commodities	Washington, D.C.	Yes	4-C-2
ME 7-6	Economic appraisal of the transportation of fresh fruits and vegetables from California and Arizona to interstate markets	Washington, D.C.	Yes	4-B-1
ME 7-7	Alternative means to increase the flexibility and reduce the costs of railroad grain transportation services	Washington, D.C.	Yes	4-F-1
ME 7-8	Analysis of economic possibilities of using air freight for moving agricultural commodities	Washington, D.C.	No	
ME 7-9	The movement of exempt agricultural commodities in interstate commerce by private motor carriers	Washington, D.C.	Yes	4-C-3
ME 7-10	Ocean freight rate series	Washington, D.C.	No	
ME 7-11	Economic analysis of trends in the transportation of grain in the Northwest	Washington, D.C. Bozeman, Mont.	Yes	4-A-1
ME 7-12	Economic analysis of the grain transportation system in the Southwest	Washington, D.C. Manhattan, Kans.	Yes	4-A-2
ME 7-13	Effects of transportation changes on the structure of grain marketing and grain marketing firms (contributing project to NCM-30, "Grain Marketing Institutions and the Structure of Grain Markets")	Washington, D.C.	Yes	4-A-3

1/ Discontinued during reporting year.

2/ Initiated during reporting year.